T.O. 1F-86D-33-1-1

TECHNICAL MANUAL

CONVENTIONAL MUNITIONS BASIC INFORMATION

USAF SERIES

F-86D, F-86F, F-86H, & F-86K

AIRCRAFT

Contract AF04(607)-6776
Contract AF04(606)-15763

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THIS PUBLICATION AUGMENTS T.O. 1F-86D-33-1-2 AND T.O. 1F-86( )-33-1-2CL SERIES CHECKLISTS.

THIS REVISION REPLACES T.O. 1F-86D-33-1-1 DATED 31 JANUARY 1964, CHANGED 29 JANUARY 1965.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

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AF SMAMA MAY 67, 500

1 APRIL 1967

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GENERAL SAFETY REQUIREMENTS

GENERAL.

These safety requirements and precautions will be complied with by armanent personnel during loading and unloading of conventional munitions. All personnel engaged directly, as well as indirectly, in operations in which explosives and/or other dangerous material are involved should be thoroughly trained in explosives safety and capable of recognizing dangerous explosive exposures. Thinking safety and working safely must become a firmly established habit when working with or in the vicinty of items capable of exhibiting a hazard due to the nature of their explosive, flammable, or toxic fillers.

REQUIREMENTS.

The general safety requirements set forth in AFM 127-100, as supplemented by this manual, will be complied with. Safety requirements peculiar to specific applications are contained in this manual. Operations and requirements not covered in this manual shall be as set forth in AFM 127-100. The absence of a safety requirement in this technical order or in AFM 127-100 does not necessarily indicate that no safeguards are needed. If immediately dangerous ammunition is encountered, all operations in the immediate vicinity will be shut down, personnel evacuated to a safe location, and EOD or other authorized personnel called to render assistance in the elimination of the hazard. Operations will not be resumed until the hazard has been eliminated.

FIREFIGHTING EQUIPMENT REQUIREMENTS.

The required firefighting equipment which must be available at the aircraft site consists of two 50-pound CO_2 fire extinguishers or one 10-gallon CB fire extinguisher. All fire hazards (cleaning fluids, oily rags, etc) and any support equipment which would interfere with firefighting procedures must be removed from the immediate area of the aircraft. Facilities for contacting the fire department communications center shall be provided.

HAZARDS OF BROMOCHLOROMETHANE (CB).

CB has toxic effects when inhaled and is irritating when it comes in contact with the skin. Particular care shall be taken to prevent CB from getting under tight clothing, such as shoes and gloves. If CB is spilled on a person, his clothing shall be removed and affected area washed immediately with soap and clear water. Clear water shall be used to wash the eyes if CB is accidentally splashed into them. Personnel experiencing symptoms of respiratory tract irritation or who have inhaled significant amounts of CB should report to the local medical authority.

INTRODUCTION

The purpose of this technical manual is to provide descriptive information for the pylons, launchers, tow-target, conventional bombs, guns, rockets, and missiles which are loaded on F-86D, F-86F, F-86H, and F-86K aircraft. Section I of this manual contains general aircraft and accessory descriptive information. Section II contains aerospace ground equipment (AGE) descriptive information. Section III contains conventional and practice munitions descriptive information.

Recommendations proposing changes to this manual shall be submitted on AFTO Form 22 in accordance with T. O. 00-5-1 to the Major Air Command for approval and forwarding to the Commander; SMAMA, McClellan AFB, California, Attention: SMNHT.

SECTION I

AIRCRAFT DESCRIPTION

1-1. GENERAL.

1-2. This section contains general descriptive information for the aircraft, end pylons, missile launchers, adapters, rocket mounts, and gun equipment which provide F-86D, F-86F, F-86H, and F-86K aircraft with armament capabilities. Descriptions of the practice bomb container and tow-target system are also contained in this section.

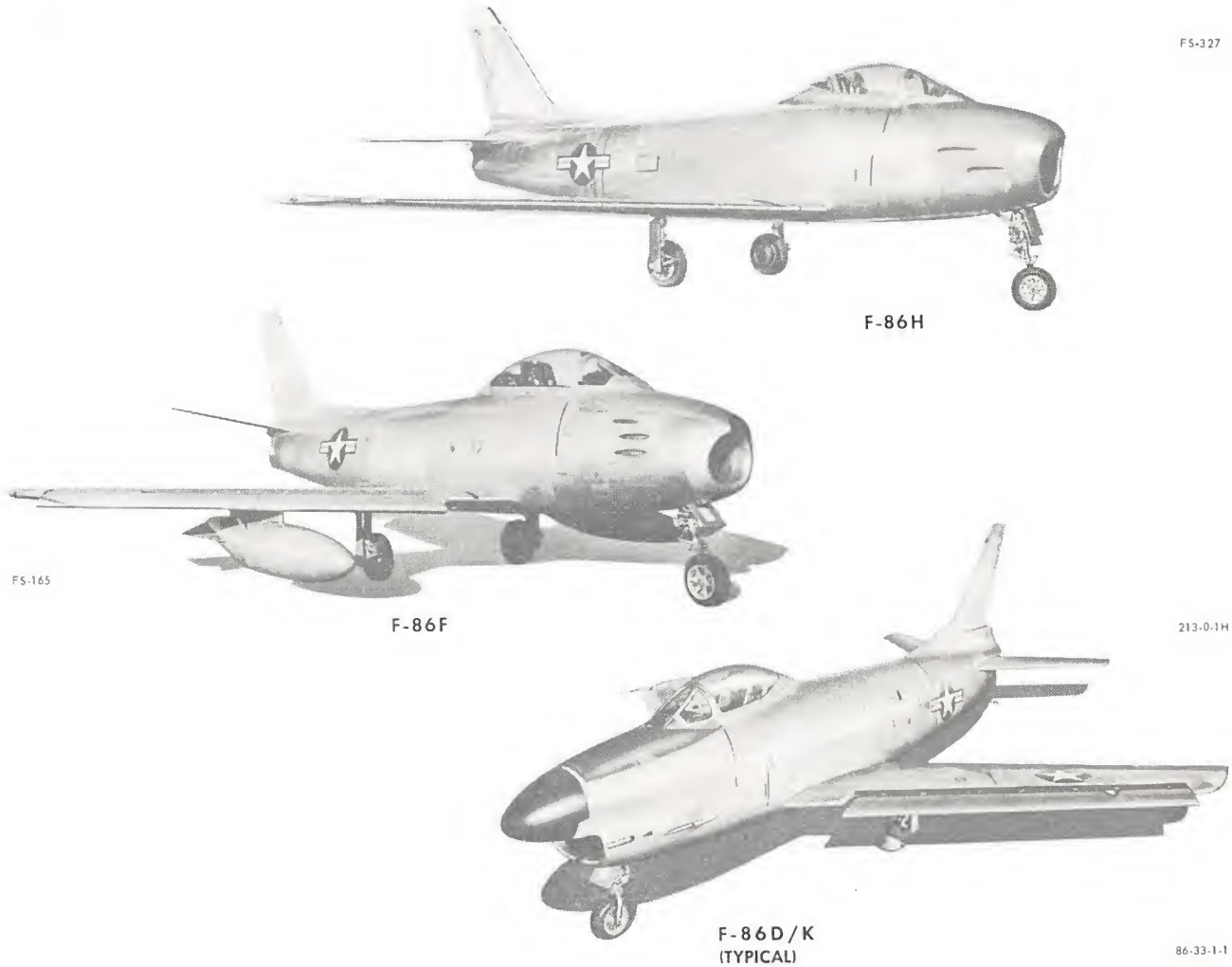


Figure 1-1. F-86 Aircraft (Typical)

1-3. AIRCRAFT CHARACTERISTICS.

1-4. The F-86D, F-86F, F-86H, and F-86K aircraft are single-place low-wing aircraft with conventional tricycle landing gear. The aircraft is powered by an axial-flow turbojet engine. (See figure 1-1.) The most distinguishing features of the aircraft are its swept wing and empennage. The aircraft is pressurized and has a clamshell-type canopy with a canopy remover device and a catapult ejection seat. The horizontal stabilizer does not have conventional elevators; longitudinal control is provided by movement of the complete

stabilizer. The fuselage rear section can be removed to facilitate an engine change. Other noteworthy features include the leading edge wing slats and fuselage speedbrakes to increase handling characteristics.

1-5. F-86D aircraft changed by T. O. 1F-86D-590 and F-86K aircraft changed by T. O. 1F-86K-546 are provided with capabilities for carrying and releasing an AIM-9B missile or TDU-11/B target rocket from adapter/pylon launcher assemblies at each inboard wing station.

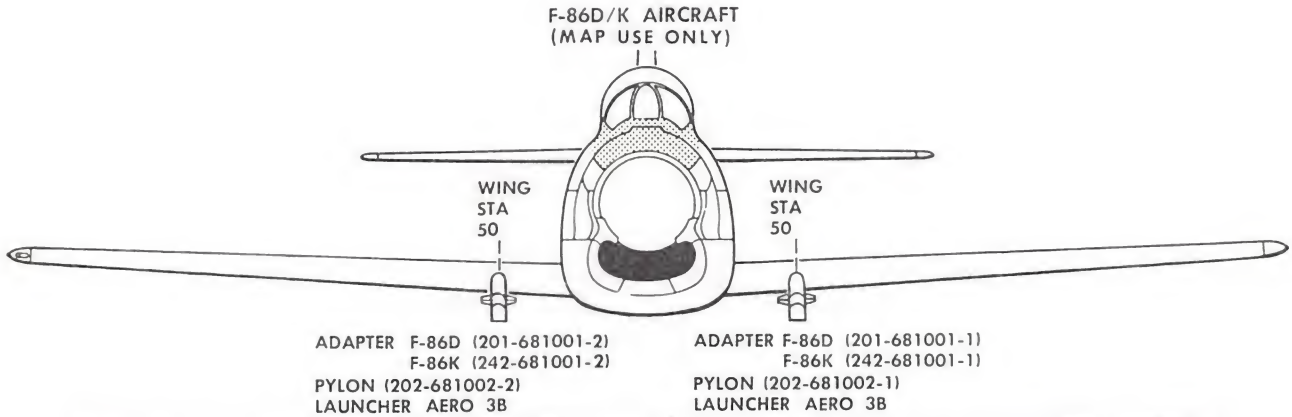
1-6. The F-86F aircraft are equipped with provisions for carrying and releasing AIM-9B missiles and TDU-11/B target rockets from externally wing-mounted pylon/launcher assemblies. Pylons capable of carrying and dropping different types of bombs or similar stores, and rocket-launcher mounts capable of carrying and releasing rocket launchers, may also be externally mounted on the aircraft wings. In addition, six . 50-caliber machine guns and related equipment are internally installed in the nose section of the aircraft.

1-7. The F-86H aircraft are equipped with provisions for carrying and releasing AIM-9B missiles and TDU-11/B target rockets from externally wing-mounted pylon/launcher assemblies. Pylons capable of carrying and dropping different types of bombs or similar stores, and rocket-launcher mounts capable of carrying and releasing rocket launchers, may also be externally mounted on the aircraft wings. In addition, four 20-millimeter automatic guns and related equipment are installed in the nose section of the aircraft.

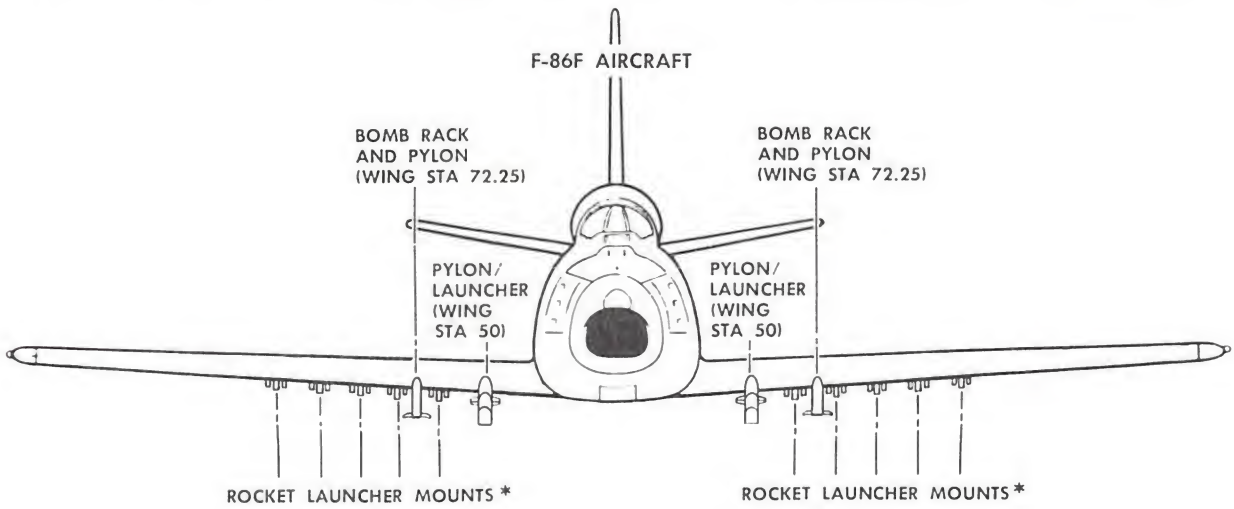
1-8. LOADING CONFIGURATION INFORMATION.

1-9. Each aircraft is equipped to carry only certain munitions and stores; therefore, the armament capabilities of each aircraft are described individually or together where applicable. The applicable Flight Manual contains approved external loading configurations for symmetrical and asymmetrical load combinations which can be carried on each aircraft. The aircraft must not be loaded contrary to the approved loading configurations at any time. Figures 1-2 and 1-3 provide information concerning the aircraft wing station loading and store capabilities.

1-10. Although the AERO 3B launcher is used on all F-86 aircraft covered in this manual, several different methods for carrying the launcher are provided and the installation is applicable only to those specific aircraft.



STORES		SUSPENSION PROVISIONS
MISSILE	AIM-9B	AERO 3B LAUNCHER
TARGET ROCKET	TDU-11/B	AERO 3B LAUNCHER



STORES		SUSPENSION PROVISIONS
BOMB CONTAINER	AF/B37K-1 (WITH BDU-33/B BOMBS)	BOMB RACK AND PYLON
ROCKET LAUNCHER	MA-2A	ROCKET LAUNCHER MOUNTS
MISSILE (MAP USE ONLY	AIM-9B	AERO 3B LAUNCHER
TARGET ROCKET (MAP USE ONLY)	TDU-11/B	AERO 3B LAUNCHER

*INBOARD ROCKET LAUNCHER MOUNTS ON F-86F-35 AIRCRAFT AF52-1072 AND ALL LATER AIRCRAFT

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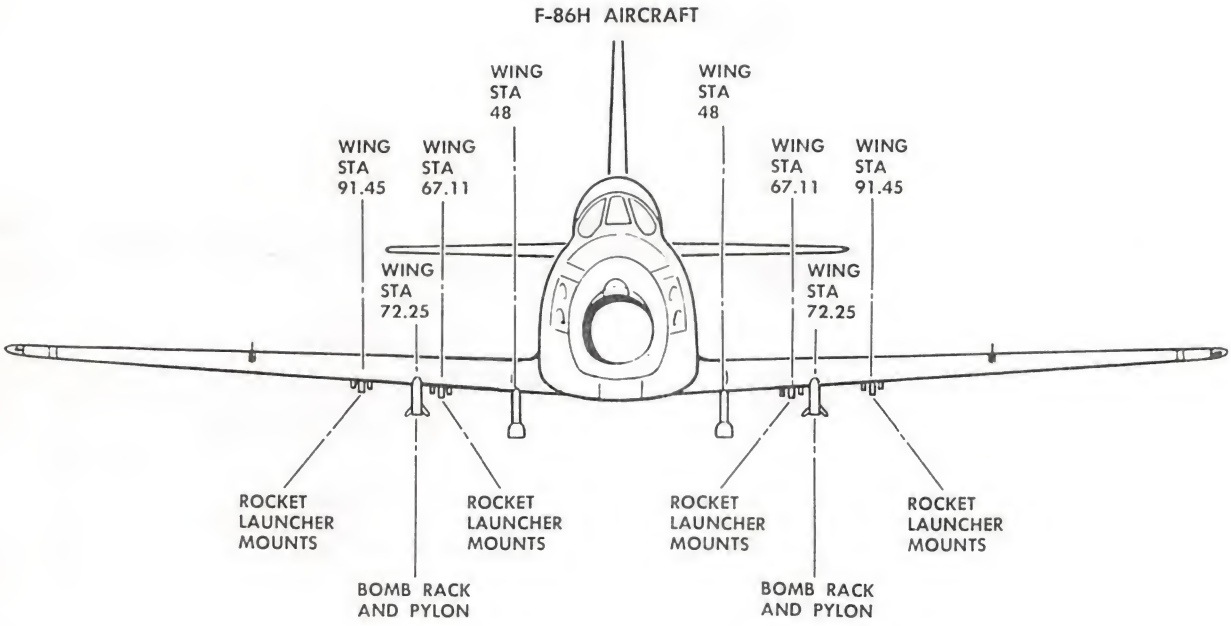
Figure 1-2. Store Capabilities and Wing Loading Stations (F-86D/K/F Aircraft)



STORES		SUSPENSION PROVISIONS
750 LB FIRE BOMBS	M116A2 ,BLU-1/B, BLU-1B/B, AND BLU-27/B	BOMB RACK AND PYLON
1000 LB BOMB	M65A1 GENERAL PURPOSE	BOMB RACK AND PYLON
750 LB BOMBS	M117 GENERAL PURPOSE MC-1 GB(TOXIC) M129E1 LEAFLET	BOMB RACK AND PYLON
500 LB BOMB	M64A1 GENERAL PURPOSE	BOMB RACK AND PYLON
BOMB CONTAINER	AF/B37K-1 (WITH BDU-23/B, BDU-33/B, OR MK 106 PRACTICE BOMBS)	BOMB RACK AND PYLON
MINE	MLU-10/B	BOMB RACK AND PYLON
MISSILE	AIM-9B	AERO 3B LAUNCHER
TARGET ROCKET	TDU-11/B	AERO 3B LAUNCHER
ROCKET LAUNCHER	MA-2A/MA-3	ROCKET LAUNCHER MOUNTS
A/A37U-15 TOW-TARGET SYSTEM	TDU-10/B DART TARGET AND LAUNCHER	BOMB RACK AND PYLON (LEFT)

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Figure 1-3. Store Capabilities and Wing Loading Stations (F-86H Aircraft)

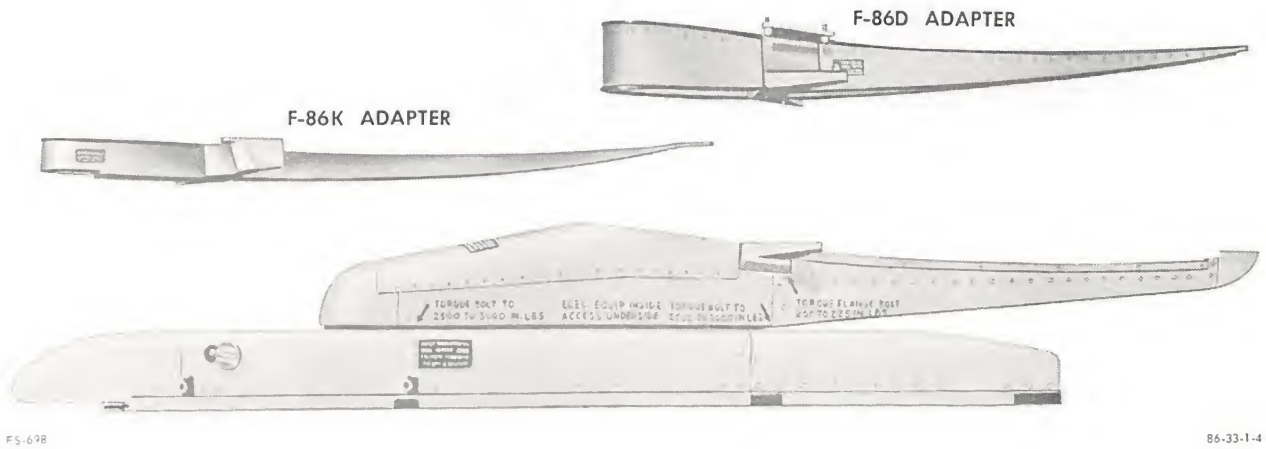

Figure 1-4. Missile Adapter/Pylon and Launcher (F-86D/K Aircraft)

1-11. MISSILE ADAPTER/PYLON AND LAUNCHER F-86D/K AIRCRAFT.

1-12. F-86D aircraft changed by T. O. 1F-86D-590 and F-86K aircraft changed by T. O. 1F-86K-546 are provided with capabilities for carrying and releasing an AIM-9B missile or TDU-11/B target rocket from each external inboard wing station. (See figure 1-4.) The external launcher provision consists of a pylon adapter, pylon, AERO 3B rail-type launcher, and associated electrical equipment. The pylon adapter is installed between the wing and pylon. This adapter points the launcher nose downward 3.7 degrees from the fuselage reference line, which then alines the missile or rocket with the aircraft sight system line of sight. The pylon adapter, pylon, and launcher are bolted together and to the wing. The pylon and launcher house the missile power supply, interlock relays, missile-firing relays, and other electrical equipment necessary to control the guidance and launching sections of the missile or rocket. No jettison provision is provided for the pylon and launcher, but the missile or rocket may be safe-launched, thereby removing the explosive munition from the aircraft in case of an emergency.

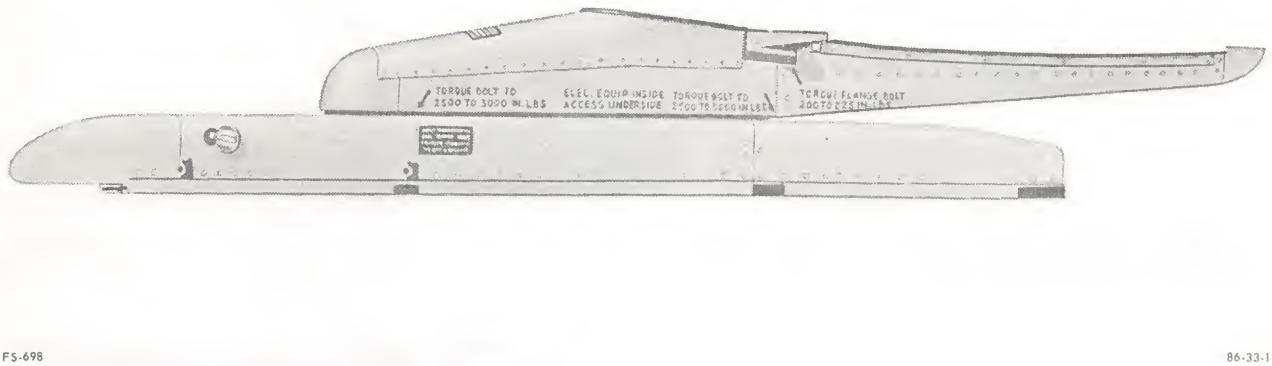

Figure 1-5. Missile Pylon/Launcher (F-86F Aircraft)

1-13. MISSILE PYLON/LAUNCHER (F-86F AIRCRAFT).

1-14. On F-86F aircraft changed by T. O. 1F-86F-533, capabilities are provided for carrying and releasing and AIM-9B missile or a TDU-11/B target rocket from a pylon/launcher assembly. (See figure 1-5.) Two pylon/launcher assemblies may be installed on the aircraft: one at each inboard wing missile station. The pylon/launcher consists of a pylon, an AERO 3B rail-type launcher, and associated electrical equipment. The pylon and launcher are bolted together and to the wing. The pylon and launcher house the missile power supply, interlock relays, missile-firing relays (left wing pylon only), and other electrical equipment necessary to control the guidance and launching sections of the missile or rocket. No jettison provision is provided for the pylon/launcher, but the missile or rocket may be safe-launched, thereby removing the explosive munition from the aircraft in case of an emergency.

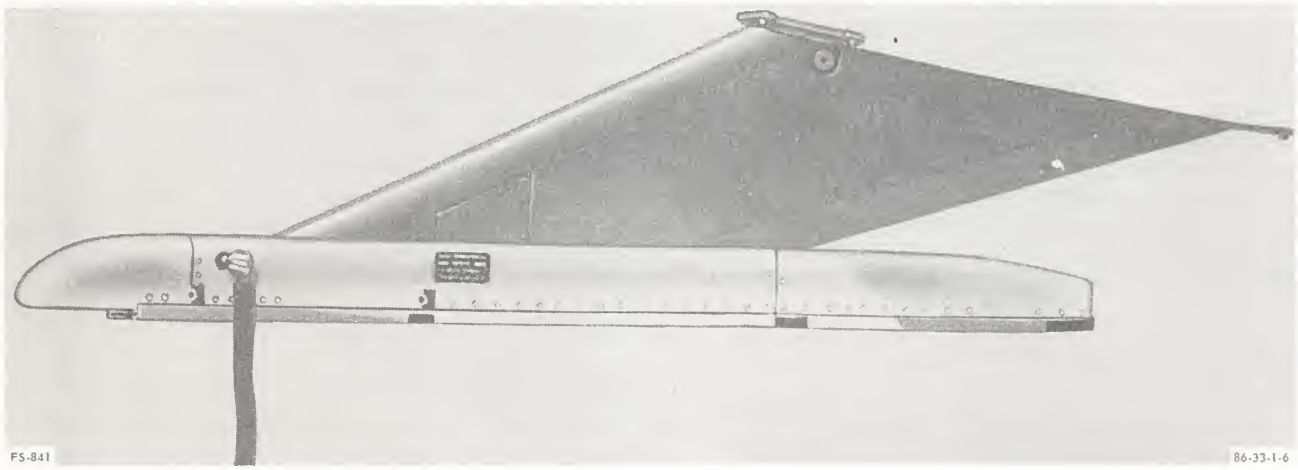

Figure 1-6. Missile Pylon/Launcher (F-86H Aircraft)

1-15. MISSILE PYLON/LAUNCHER (F-86H AIRCRAFT).

1-16. On F-86H aircraft changed by T. O. 1F-86H-663, capabilities are provided for carrying and releasing an AIM-9B missile or a TDU-11/B target rocket from a pylon/launcher assembly. (See figure 1-6.) Two pylon/launcher assemblies may be installed on the aircraft: one at each inboard wing missile station. Each pylon/launcher assembly consists of a pylon, an AERO 3B rail-type launcher, and associated electrical equipment. An adapter which provides for installation of the pylon/launcher assembly is attached

to the aircraft wing. The pylon and launcher are bolted together and are normally installed on the aircraft as a unit. No jettison provision is provided for the pylon launcher assembly, but the missile or target rocket may be safe-launched; thereby removing the explosive munition from the aircraft in case of an emergency. The missile-firing relays, interlock relays, select relay, and other equipment necessary to control the guidance and launching systems of the missile or target rocket are installed within the aircraft.

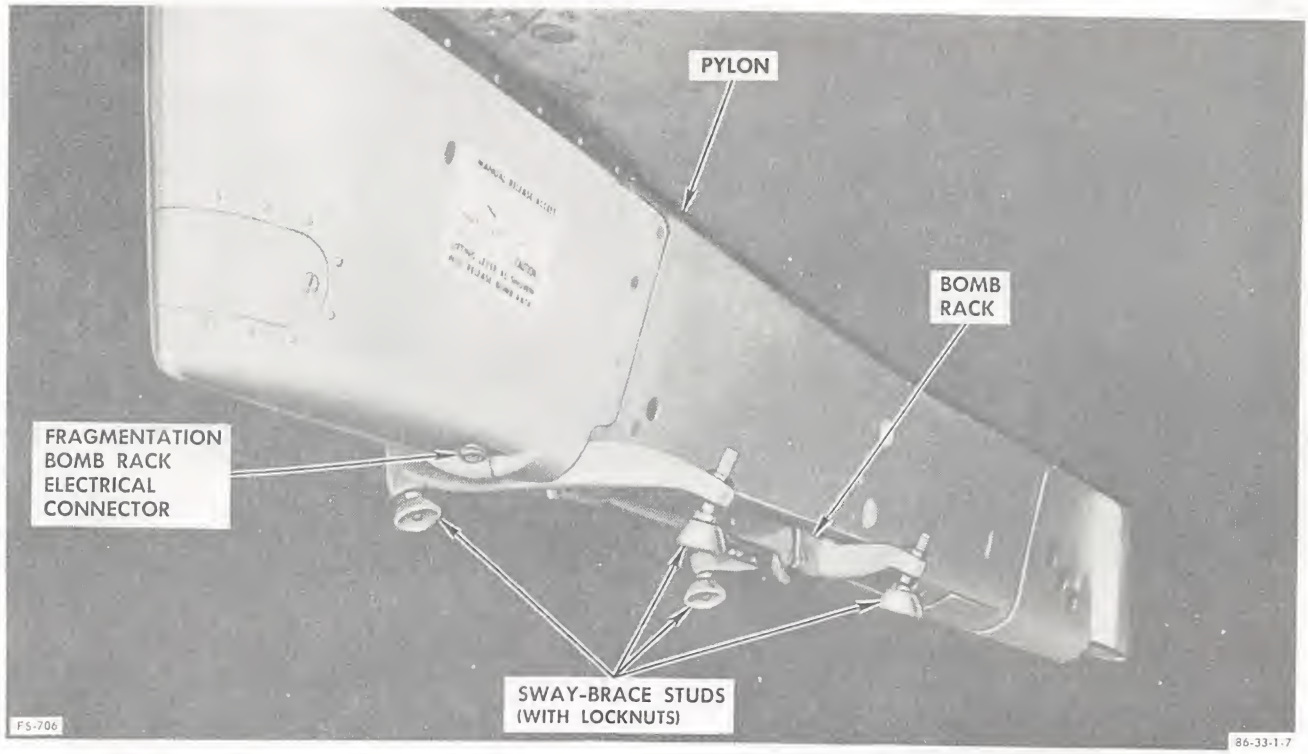

Figure 1-7. Bomb Rack and Pylon (F-86F Aircraft)

1-17. BOMB RACK AND PYLON (F-86F AIRCRAFT).

1-18. The F-86F aircraft are provided with external wing pylons which will accommodate a single 250- to 1, 000-pound general-purpose bomb, up to a 750-pound napalm bomb, or other similar stores. The pylon, which features electrical or manual release, is installed at each external wing station 72. 25. Each pylon is equipped with a bomb rack, bomb rack supports and fairings, sway braces, mechanical linkage, and electrical wiring. (See figure 1-7.) The sway braces are adjustable for munitions/stores of various diameters. Flush-type covers, on the underside of the wings, provide access to electrical receptacles that permit connection between the pylon bomb racks and the aircraft bombing controls. The bomb rack is the operating mechanism of each pylon. The bomb rack must be manually cocked and locked, but it may be electrically or mechanically released. Two arming wire mechanisms are installed in the bomb rack. These mechanisms provide for nose, tail, or combination arming of bomb fuzes. The bomb racks are spaced to accept munition or store suspension lugs which are spaced 14 inches apart. The pylon and bomb rack are bolted together and to the aircraft wing. No pylon jettisoning provision is supplied.

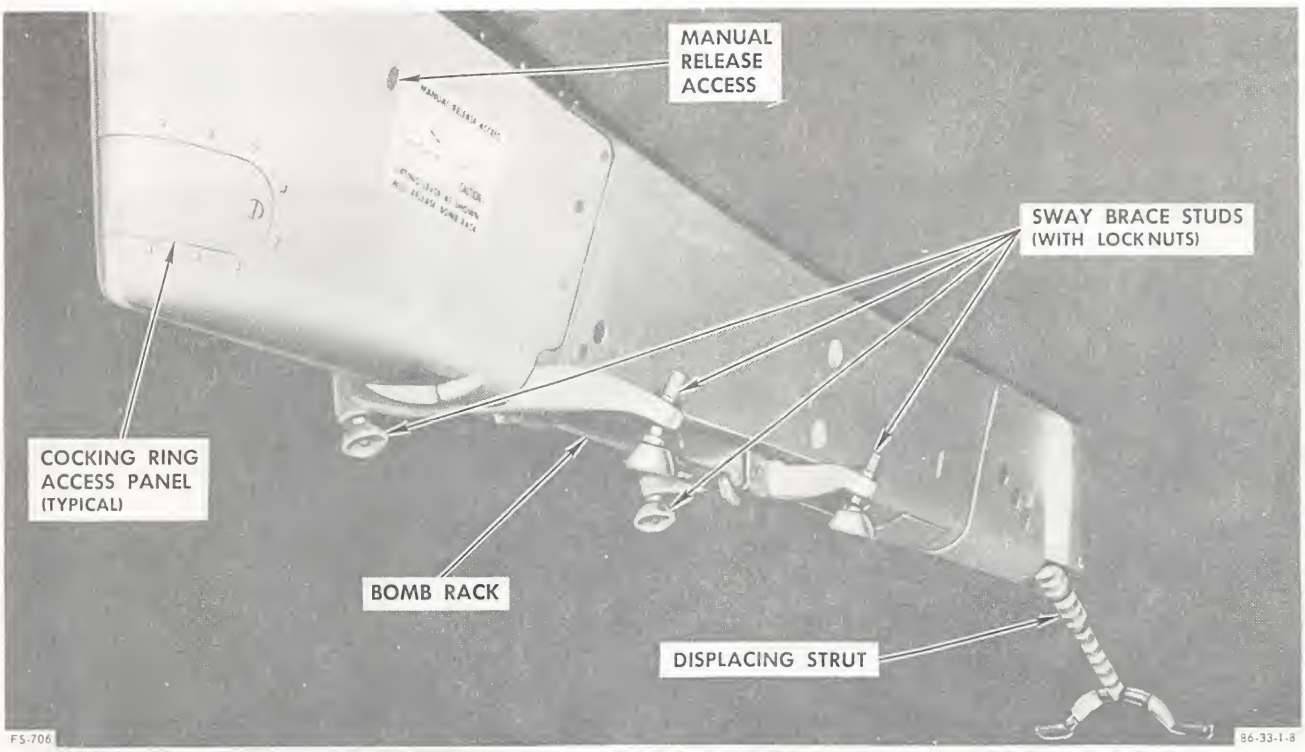

Figure 1-8. Bomb Rack and Pylon (F-86H Aircraft)

1-19. BOMB RACK AND PYLON (F-86H AIRCRAFT).

1-20. The F-86H aircraft are provided with external wing pylons which will accommodate a single 250- to 1,000-pound general-purpose bomb or up to a 750-pound napalm bomb. The pylon, which features electrical release or manual release, is installed at each external inboard wing station. The pylon is equipped with an MA-4 bomb rack, bomb rack supports and fairings, sway-brace studs and locknuts, mechanical linkage, and electrical wiring. (See figure 1-8.) There is also a displacing strut for use when a napalm bomb is carried. The sway-brace studs are adjustable for munitions/stores of various diameters. A flush-type cover, on the underside of the wing aft of the pylon, provides access to an electrical receptacle that permits connection between the pylon bomb rack and aircraft bombing controls. The bomb rack is the operating mechanism of the pylon. The bomb rack must be manually cocked and locked, but it may be electrically or mechanically released. Two arming wire mechanisms are installed in the bomb rack. These mechanisms provide for nose, tail, or combination arming of bomb fuzes. The bomb rack hooks are spaced to accept munition or store suspension lugs which are spaced 14 inches apart. The pylon and bomb racks are bolted together and to the aircraft wing. No pylon jettisoning provision is supplied.

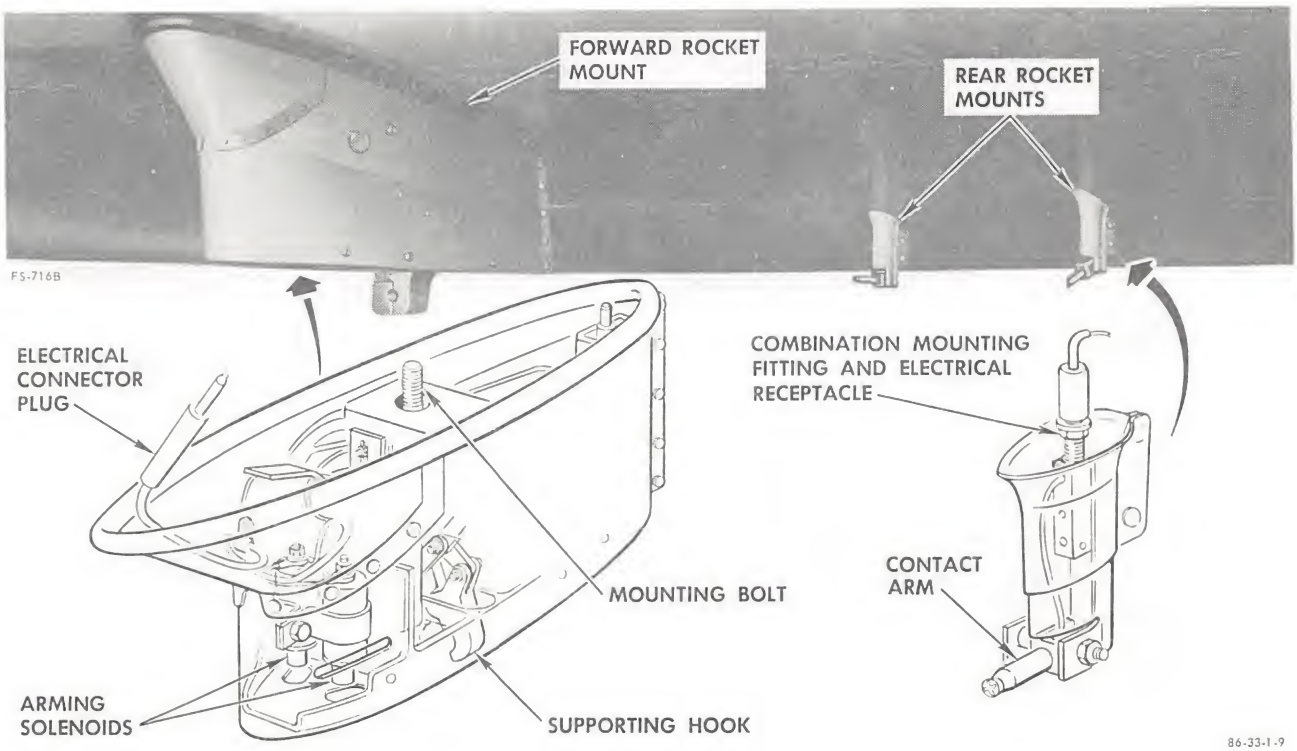

Figure 1-9. Rocket Launcher Mounts (F-86F Aircraft)

1-21. ROCKET LAUNCHER MOUNTS (F-86F AIRCRAFT).

1-22. The rocket launcher mounts installed on F-86F aircraft provide for carrying and releasing multiple-type rocket launchers. The zero-rail rocket launcher mounts are externally mounted on the lower surface of each aircraft wing. (See figure 1-9.) Each installation consists of three mounts, one forward and two rear. The forward mount houses the rocket jettison unit and two arming solenoids. The rocket jettison unit consists mainly of a rotary solenoid, a lock mechanism, and a supporting hook. The hook is held closed by the locking mechanism. When the rotary solenoid is energized during salvo or jettison release, it rotates, allowing the locking mechanism to free the supporting hook. This permits the weight of the rocket launcher to open the supporting hook, causing the rocket launcher to be released. The two arming solenoids in each forward rocket mount provide for rocket fuze arming. The rear launcher mounts are provided with electrical wiring which completes the rocket-firing circuitry between the aircraft and the rocket launcher. All rocket launcher mounts are bolted to the aircraft wings.

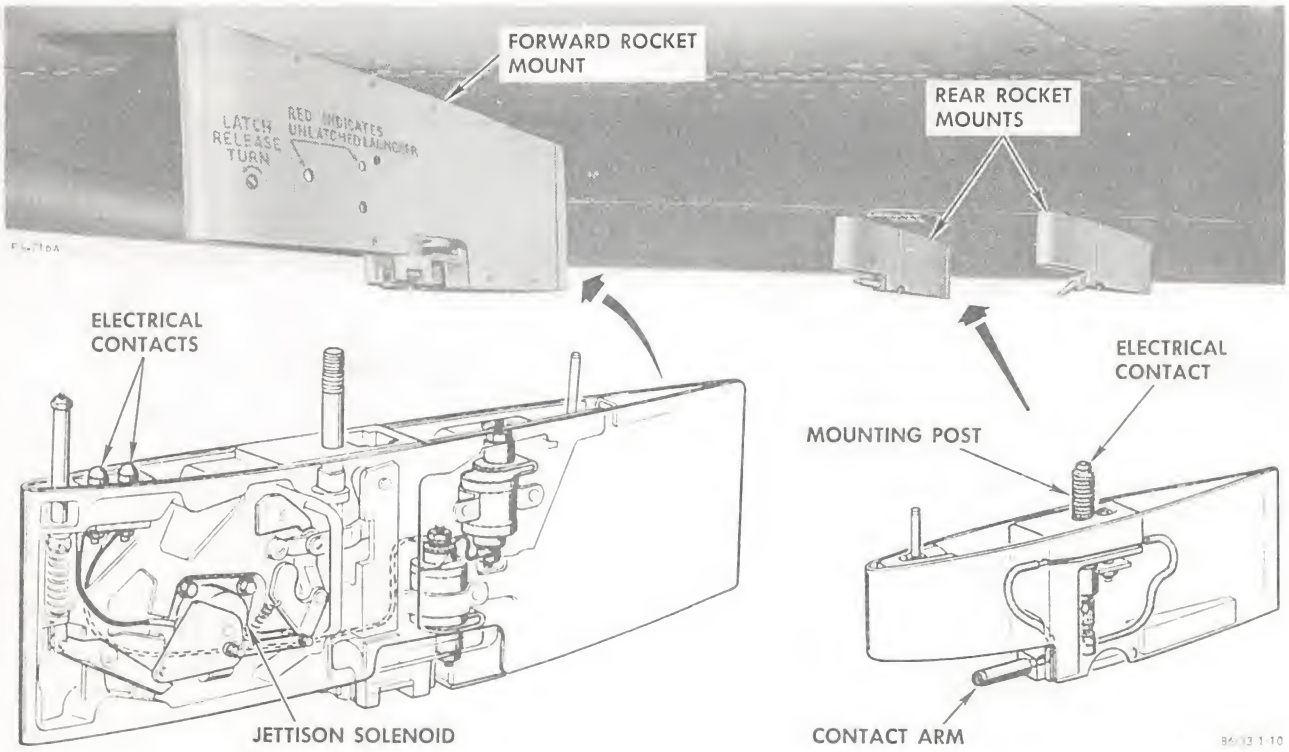

Figure 1-10. Rocket Launcher Mounts (F-86H Aircraft)

1-23. ROCKET LAUNCHER MOUNTS (F-86H AIRCRAFT).

1-24. The rocket launcher mounts installed on F-86H aircraft provide for carrying and releasing multiple-type rocket launchers. The zero-rail rocket launcher mounts are externally mounted on the lower surface of each aircraft wing. (See figure 1-10.) Each installation consists of three mounts, one forward and two rear. The forward mount houses the rocket jettison unit and two arming solenoids. The rocket jettison unit consists mainly of a rotary solenoid, a lock mechanism, and a supporting hook. The hook is held closed by the locking mechanism. When the rotary solenoid is energized during salvo or jettison release, it rotates, allowing the locking mechanism to free the supporting hook. This permits the weight of the rocket launcher to lower the supporting hook, causing the rocket launcher to be released. The two arming solenoids in each forward rocket mount provide for fuze arming. The rear launcher mounts are provided with electrical wiring which completes the rocket-firing circuitry between the aircraft and the rocket launcher. All launcher mounts are bolted to the aircraft wings.

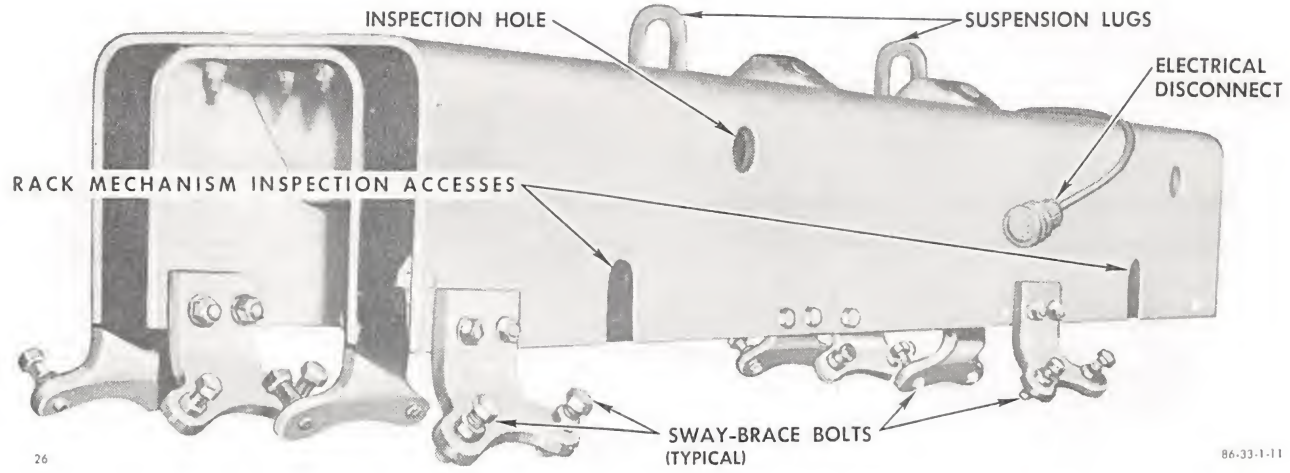

Figure 1-11. AF/B37K-1 Practice Bomb Container

1-25. BOMB CONTAINER, PRACTICE, AF/B37K-1 (F-86F/H AIRCRAFT).

1-26. The AF/B37K-1 practice bomb container is designed to carry and release four 25-pound BDU-23/B, BDU-33/B, or MK 106 practice bombs and other similar stores. (See figure 1-11.) The bomb container has four electromechanical bomb racks internally installed. Each rack is equipped with a mechanical release as well as an electrical release. Each rack is provided with four sway-brace bolts attached to the container body. These bolts are used to aline and secure each bomb in position after it is loaded on the container. Two U-shaped bolts are attached to the top of the container to provide for suspension. An electrical harness and plug provide for connection to the aircraft bomb release circuitry. A transfer switch in the container bomb rack circuit transfers the electrical release impulse from one rack to another whenever the circuit is deenergized and then energized again. The sequential order of the bomb release is right rear rack, left rear rack, left front rack, and right front rack.

1-27. PHYSICAL CHARACTERISTICS.

1-28. Weight:

a. Weight of bomb container unloaded: approximately 80 pounds.

b. Weight of bomb container loaded: approximately 175 pounds.

1-29. Dimensions:

a. Length of bomb container: 46 inches.

b. Width of bomb container: 9.125 inches.

c. Height of bomb container: 6 inches.

1-30. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug.

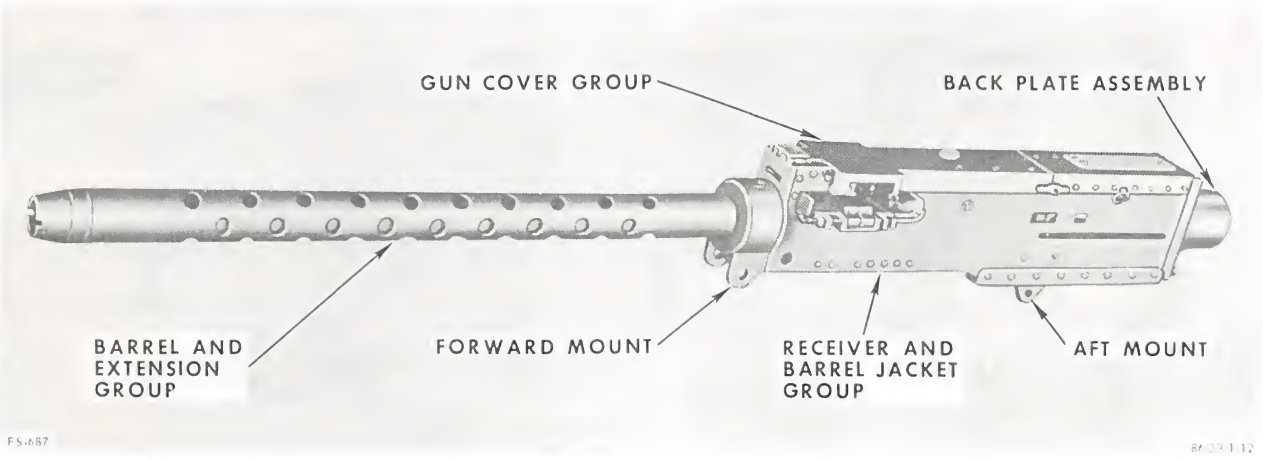

Figure 1-12. M-3 Gun

1-31. GUN, M-3, .50-CALIBER (F-86F AIRCRAFT).

1-32. The F-86F aircraft gunnery system consists of six Type M-3 .50-caliber machine guns and related equipment. Three guns are installed in each right and left gun bay compartment adjacent to the cockpit. Ammunition and expanded case and link compartments are directly below the gun bay compartments.

1-33. The M-3 gun is an automatic recoil-operated, link-belt fed, air-cooled weapon. (See figure 1-12.) The gun has a firing rate of 1,150 to 1,250 rounds of .50-caliber ammuntion per minute. A metallic link belt of the disintegrating type is used to feed the ammuntion into the gun. As the gun bolt mechanism is operated, the belt moves into the gun. The round is removed from the belt and the link is ejected into the expended link compartment. After a round is fired, the empty case is ejected into the expended case compartment. The gun bolt mechanism is operated by recoil forces from the explosive gases of the cartridges.

1-34. PHYSICAL CHARACTERISTICS.

1-35. Weight:

a. Weight of gun assembled: approximately 69 pounds.

1-36. Dimensions:

a. Length of gun assembled: 57.5 inches.

b. Width of gun assembled: approximately 5 inches.

c. Height of gun assembled: approximately 9 inches.

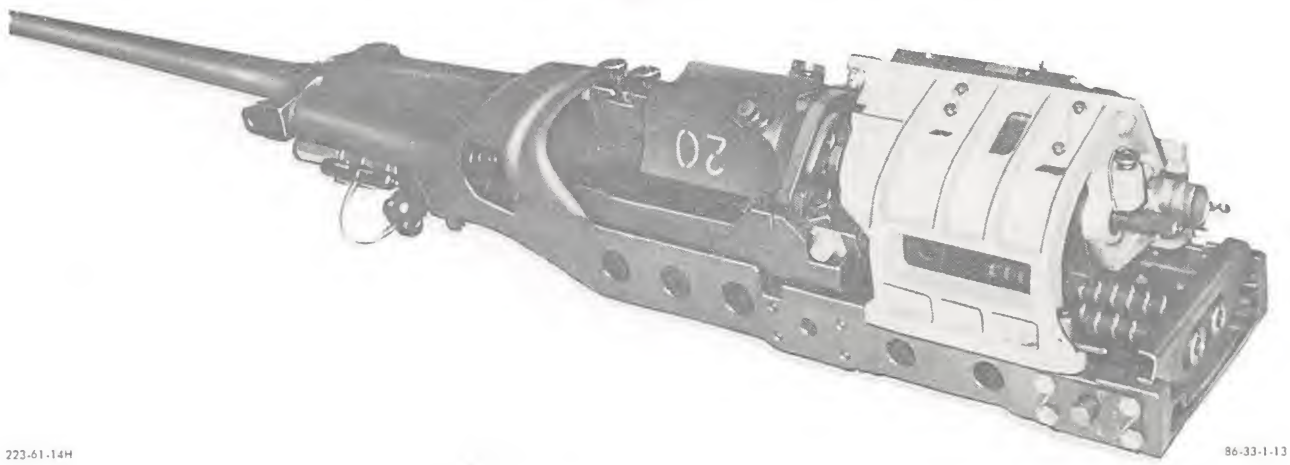

Figure 1-13. M-39 Gun

1-37. GUN, M-39, 20-MILLIMETER (F-86H AIRCRAFT).

1-38. F-86H aircraft AF52-2090 and all later aircraft are equipped with four M-39 or M-39A1 20-millimeter guns and related equipment. The equipment includes provisions for purging gun, ammunition, and expended-link compartments of potentially dangerous accumulations of explosive gun gases during and after gunfire. Two guns are on each side of the aircraft in the gun bay compartments below the cockpit. Two ammunition containers (cans) are directly below each gun bay compartment, and the expended links are retained in a compartment between the ammunition containers. Expended cases are ejected overboard.

1-39. The M-39 gun is a 20-millimeter, gas-operated, belt-fed, electrically fired, revolver-type weapon. (See figure 1-13.) Each gun is capable of rapid fire of from 1, 500 to 1, 700 rounds of ammunition per minute, with an effective range of 3, 500 feet. The gun may be fed from either the left or right side. A metallic link belt of the disintegrating type is used to feed the ammunition into the gun. The main components of the gun consist of a barrel assembly, a receiver assembly, a drum and cradle assembly, a feeder assembly, and a gun charger assembly. The main components are assembled together, dependent upon whether the gun is to be used for a left or right installation.

1-40. PHYSICAL CHARACTERISTICS.

1-41. Weight:

a. Weight of assembled gun: 179 pounds.

1-42. Dimensions:

a. Length of assembled gun: 72. 4 inches.

b. Width of assembled gun: approximately 12 inches.

c. Height of assembled gun: approximately 12 inches.

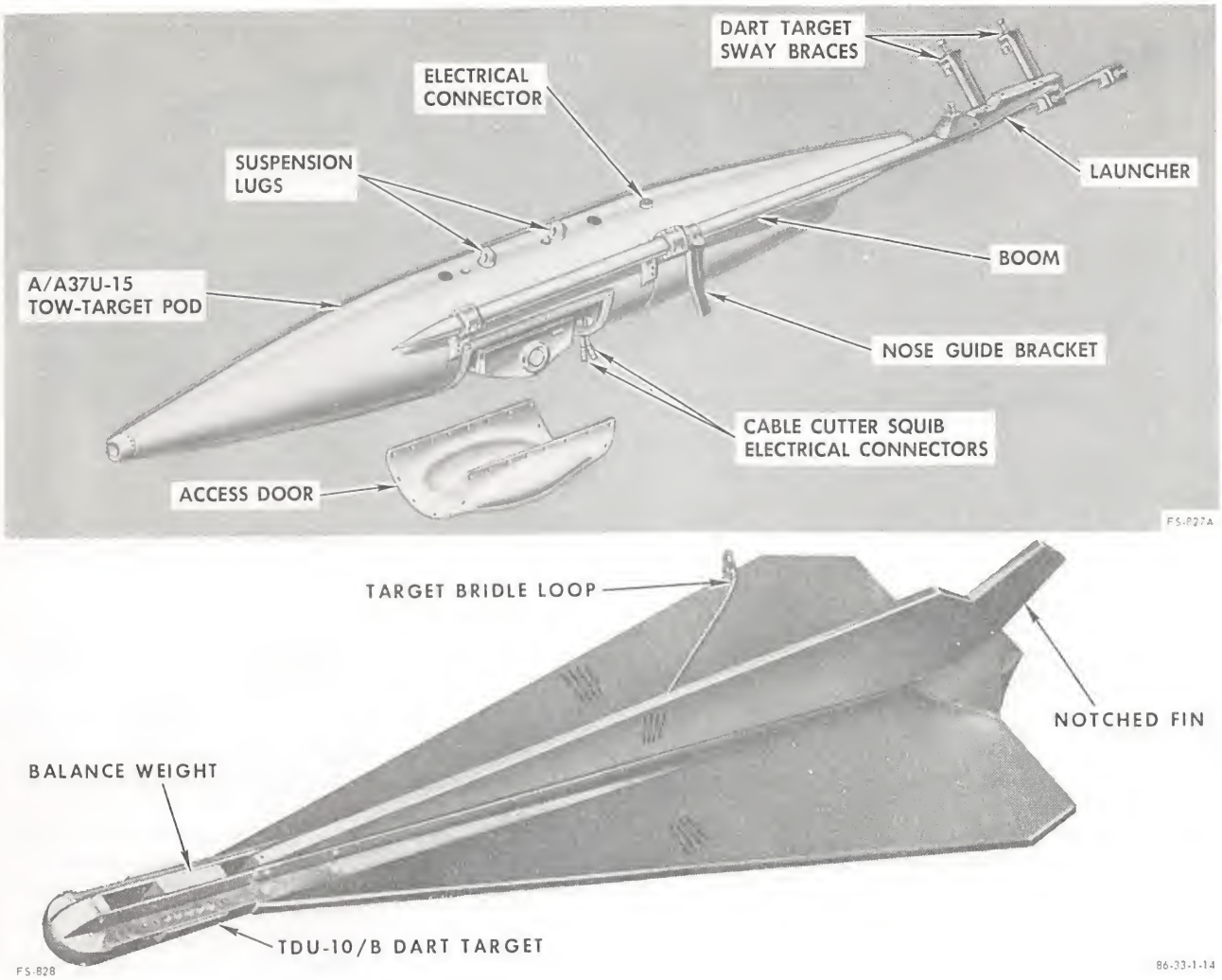

Figure 1-14. A/A37U-15 Dart Tow-Target System (F-86H Aircraft)

1-43. TOW-TARGET SYSTEM, A/A37U-15 (F-86H AIRCRAFT).

1-44. The A/A37U-15 tow-target system is used for air launching, towing, and releasing a high-speed dart target. This target is utilized for air-to-air gunnery training. (See figure 1-14.) The system consists of a TDU-10/B (K-11) dart target and a tow-target pod containing a tow-reel assembly within the center section. A boom and launcher for carrying the dart target is attached to the left upper side of the pod. A parachute recovery unit for recovering the dart target is available for use with this system. The assembled tow-target system components are carried at the left external wing station from a bomb pylon when used with F-86H aircraft. The aircraft bomb release electrical circuitry is utilized for launching and releasing the dart target from the aircraft.

1-45. PHYSICAL CHARACTERISTICS.

1-46. Weight:

a. Weight of assembled tow-target system (2, 300 feet of 11/64-inch-diameter armored tow cable): approximately 825. 0 pounds.

1-47. Dimensions:

a. Length of assembled tow-target system: approximately 25 feet.

b. Diameter of two-target pod: approximately 18 inches.

1-48. BASIC COMPONENTS OF A/A37U-15 TOW-TARGET SYSTEM.

1-49. DART TARGET ASSEMBLY. The TDU-10/B (K-11) dart target is an aerial tow-target which consists of four fins mounted on a common keel, two suspension lugs, an adjustable balance weight, and a bridle assembly. The fins are constructed from honeycomb and aluminum sheeting. One fin of the target is notched to provide clearance for flight control operation when used with certain tow-target systems. The balance weight, on the nose of the target, may be adjusted to compensate for different towing speeds of the target. A bridle assembly is attached to the keel of the target.

1-50. TOW-TARGET POD. The tow-target pod is a fiber-glass fairing designed to aerodynamically streamline the tow-reel assembly. The pod is provided with suspension provisions so that it may be used with standard Air Force 14-inch or 30-inch spacing bomb racks. Electrical cable assemblies which permit the pod to be adapted to different aircraft are supplied with the pod. Access doors on the bottom of the pod provide for installation of the tow-reel assembly and explosive squibs in the cable-cutter mechanisms. A duct, mounted in the forward section of the pod, supplies cooling air for the tow-reel assembly braking unit during cable reel-out.

1-51. TOW-REEL ASSEMBLY. The tow-reel assembly comprises a frame assembly with a removable tow reel. Two squib-actuated cable-cutter mechanisms are mounted at the rear of the frame assembly. The tow reel is a one-way reel capable of carrying approximately 2, 300 feet of 11/64-inch-diameter armored cable of 5, 000 feet of 1/8-inch-diameter cable. A self-energized inertial brake, actuated by fly-weights mounted on the reel drum, is incorporated in the tow reel. This brake controls reel out of the tow cable at a predetermined speed. During installation of the tow reel, the tow cable is routed through the cable-cutter mechanisms. At completion of the towing mission, an electrical signal from the aircraft ignites a squib which actuates one of the cable-cutter mechanisms. In case of a malfunction, the other cable-cutter mechanism squib is ignited by a separate signal from the aircraft. The tow cable is severed, and the target is released from the aircraft. A nylon rope, approximately 25 feet in length, is provided for connection between the tow cable and target. The purpose of this rope is to decrease the shock that occurs when the dart target is initially launched from the aircraft.

1-52. PARACHUTE RECOVERY SYSTEM. The parachute recovery system consists basically of a canister, a parachute, and a canister lid. The canister is cylindrical and has two fasteners for connecting the tow cable and nylon rope. The parachute D-ring is also connected to the forward fastener. When installed, the canister is attached to the tow-target pod with cloth tape, and it serves as a link between the tow cable and nylon rope. The canister lid is designed with two aerodynamically actuated levers. Whenever the tow cable is severed at the completion of the towing mission, the tow cable trails behind the dart target and causes the canister to reverse its normal position. The canister lid levers are actuated, and the lid separates from the canister. The lid, which is fastened to the top of the parachute, then serves as a drogue to deploy the parachute.

1-53. BOOM AND LAUNCHER. The boom and launcher secure the dart target to the tow-target pod during aircraft flight. The boom is attached to the pod so that the dart target can be installed without interference to the aircraft flight control surfaces. A target nose guide is attached to the boom and can be adjusted as required to fit the target. The launcher is mounted on the rear of the boom. The launcher consists of a standard Air Force 14-inch bomb rack enclosed within a housing and four sway braces. The bomb rack must be manually cocked when the target is installed, but it is released electrically by a signal from the aircraft. The bomb rack also has a manual release mechanism which may be used by ground personnel for removal of the target. The sway braces are fitted with adjustable pods which are positioned to support the dart target fins. When adjusted, the sway-brace pads prevent lateral oscillation of the dart target during aircraft flight.

SECTION II

AEROSPACE GROUND EQUIPMENT (AGE) DESCRIPTION

2-1. GENERAL.

2-2. Descriptive information concerning the ground handling and test equipment required when accomplishing the loading and functional check procedures in T. O. 1F-86D-33-1-2 is provided in this section. Only authorized personnel are permitted to operate ground handling and/or test equipment. Substitute equipment may be used if recommended equipment is not available, provided that substitute equipment equals or exceeds the minimum requirements of recommended equipment.

2-3. GROUND HANDLING EQUIPMENT.

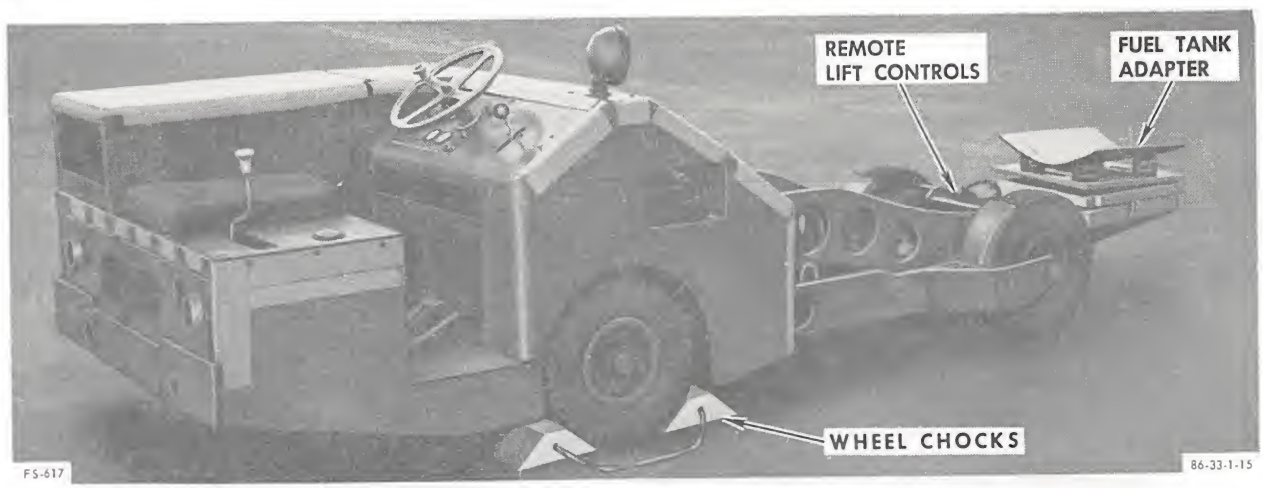

Figure 2-1. MJ-1 Bomb Lift Truck

2-4. TRUCK, BOMB LIFT, MJ-1.

2-5. The MJ-1 bomb lift truck (figure 2-1) is a 3,000-pound capacity bomb lift truck which may be used to load munitions and stores onto the aircraft. It is powered by a gasoline engine. The truck has a turning radius of 8.75 feet. The mechanical controls for operation of the MJ-1 truck are similar to the controls of an automobile. The controls consist of a steering wheel, a clutch, a gearshift, a footbrake and a handbrake, an accelerator, a choke, and a hand throttle. The lifting mechanism consists of two pairs of cantilever arms, two hydraulic cylinders, and a bomb table. The bomb table consists of a rotating plate, four rollers, a tilting plate, a lateral-movement plate, a longitudinal-movement plate, and four valves. The rotating plate turns 360 degrees about the vertical axis of the bomb table, and the rollers allow the store to be turned about its horizontal axis. The hydraulic valves on the bomb table control panel are positioning controls for the 5-degree nose-up or 5-degree nose-down movement (TILT), 4-3/4 inch longitudinal movement (LONGITUDINAL), and lift movement (LIFT ARMS). Using the LIFT ARMS control, the bomb table can be lowered to a point where the top of the table is 6-1/4 inches above the ground or raised to a point where it is 78 inches above the ground.

2-6. ADAPTER, FUEL TANK.

2-7. The fuel tank adapter is a half shell with flanged lips and open ends and is constructed of steel with a rubber lining. The adapter may be attached to various lifting units to provide a support when lifting flush-sided bombs, launchers, and other tank-type stores. Whenever a store with an extrusion such as a lug, flange, etc, must be lifted, a split-type adapter is used to prevent damage to the store.

2-8. STAND, BOMB.

2-9. Several different bomb stands are suitable for use with the stores that are compatible with F-86 aircraft; therefore, any of these may be used provided structural strength is sufficient to support the store. Also, cradle supports must be spaced to provide access for the bomb lift to raise the store.

2-10. TRAILERS AND TRUCKS, TRANSPORT.

2-11. Although many different types of trucks and trailers are suitable for transporting munitions or stores from one location to another, care must be exercised in selecting a suitable unit. Transport units must be strong enough to support munitions or stores, and a cradle or frame designed to fit the contour of the munition or store must be provided. Tiedown provisions must be installed on the unit. Whenever available, it is recommended that an MHU-12/M munitions handling trailer be used. This trailer is a non-self-propelled roadable unit with a rated capacity of 5,000 pounds. (See figure 2-2.) Various adapters, cradles, and tiedown kits are provided so that this trailer can be configured to satisfactorily transport a variety of munitions/stores.

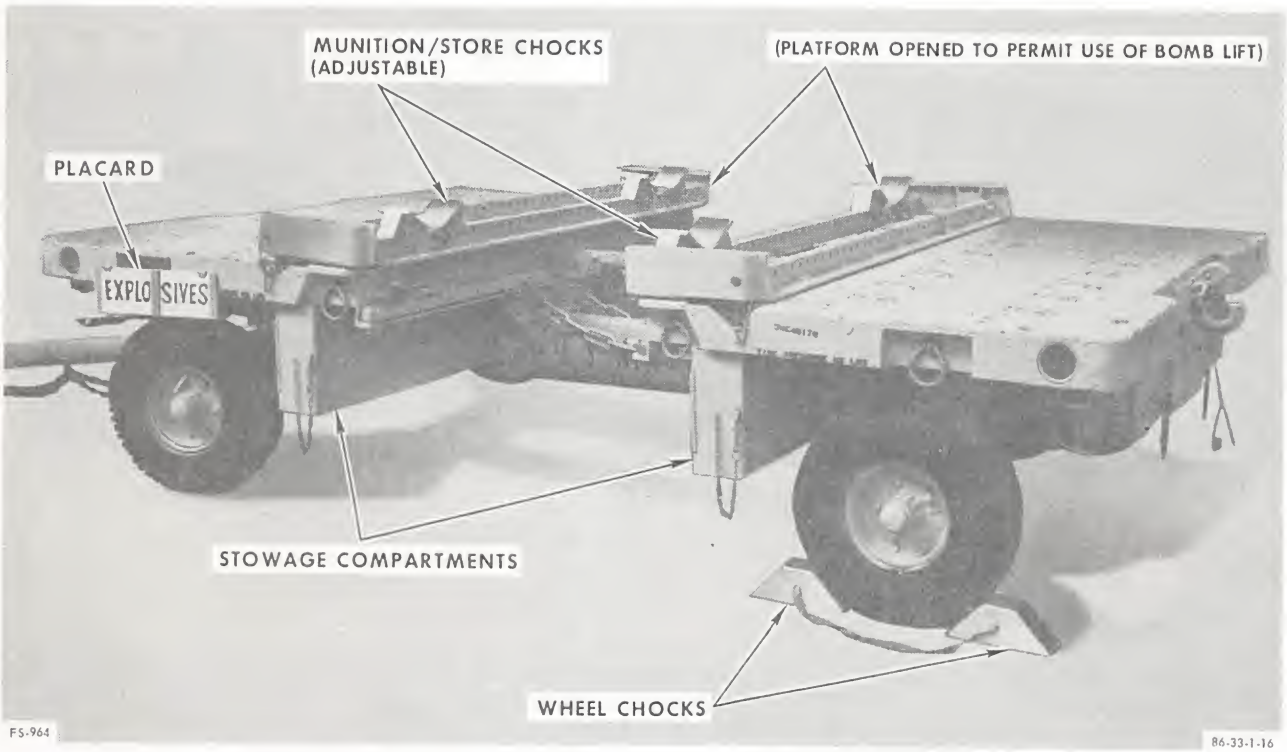

Figure 2-2. MHU-12/M Munitions Handling Trailer

2-12. POWER UNITS, ELECTRICAL, EXTERNAL.

2-13. Many external electrical power units are suitable for use with F-86 aircraft. Any of these units may be used, provided the voltage output and ampere rating are sufficient. The power unit must be capable of producing 28-volt dc, 400-ampere electrical power.

2-14. TEST EQUIPMENT.

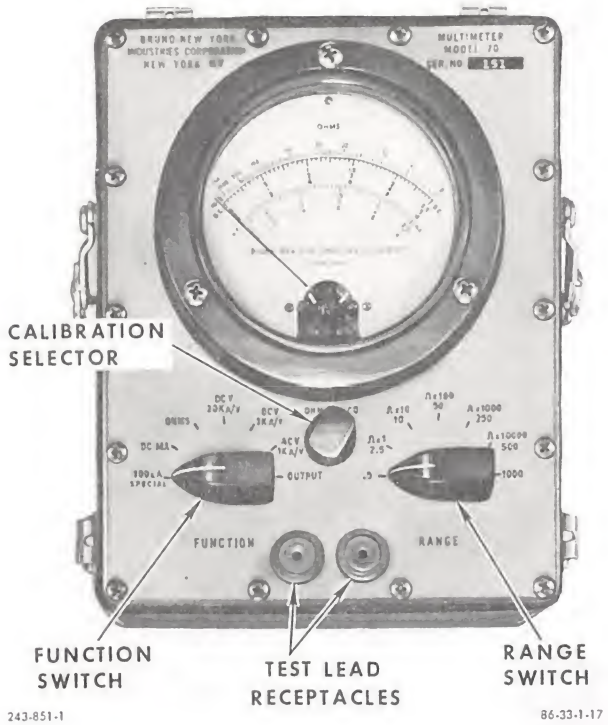

Figure 2-3. AN/PSM-6 Multimeter

2-15. MULTIMETER, AN/PSM-6 (AN/PSM-6A).

2-16. The AN/PSM-6 multimeter (figure 2-3) is a general-purpose test instrument which combines the functions of a dc voltmeter (with both 20,000-ohm/volt and 1,000-ohm/volt sensitivity), an ac voltmeter, and an ohmmeter. The settings of the FUNCTION and RANGE switches control the characteristics and ranges of the meter circuit. The test lead connections are made to the two jacks at the bottom of the panel. A "zeroing" control is provided for the resistance ranges to compensate for variations in battery voltage. The multimeter is completely self-contained and is equipped with various accessories to test different units.

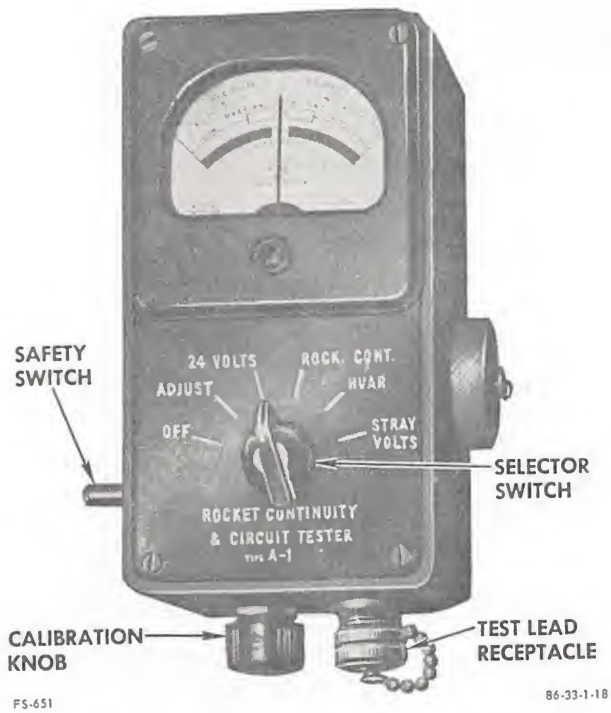

Figure 2-4. A-1 Rocket Continuity and Circuit Tester

2-17. TESTER, ROCKET CIRCUIT AND CONTINUITY, A-1.

2-18. The A-1 rocket continuity and circuit tester (figure 2-4) is an instrument used to test selected aircraft and missile electrical circuits. The tester consists of a sensitive indicating instrument, a voltage source (C-size dry cell battery), a calibrating circuit, two voltage measuring circuits, two resistance measuring circuits, and the necessary leads for rapid connection to the circuits to be tested. The safety switch on the side of the unit deenergizes the internal circuits when it is depressed. The selector switch sets up the internal circuits so that various checks can be made. A calibration knob is provided so that the tester can be adjusted to compensate for variations in battery voltage.

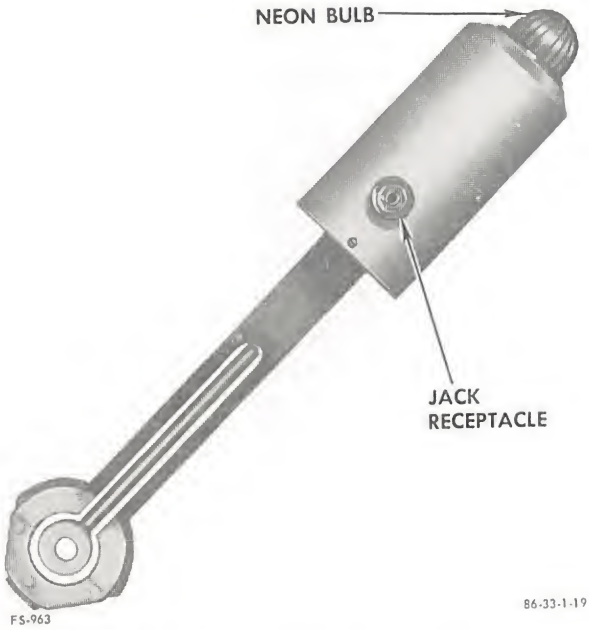

Figure 2-5. E3279 Firing Pin Circuit Checker

2-19. CHECKER, FIRING PIN CIRCUIT, E3279.

2-20. The E3279 firing pin circuit checker (figure 2-5) is a tool designed for checking the firing voltage of an M-39 series gun without removing the gun drum. The checker has a narrow arm which can be inserted between the gun rotating drum and drum cradle assembly to make contact with the gun firing pin. A neon light bulb on the top of the checker provides a visual indication of voltage at the firing pin when the checker is installed. Also, the checker has a jack plug receptacle to provide for connection of a multimeter.

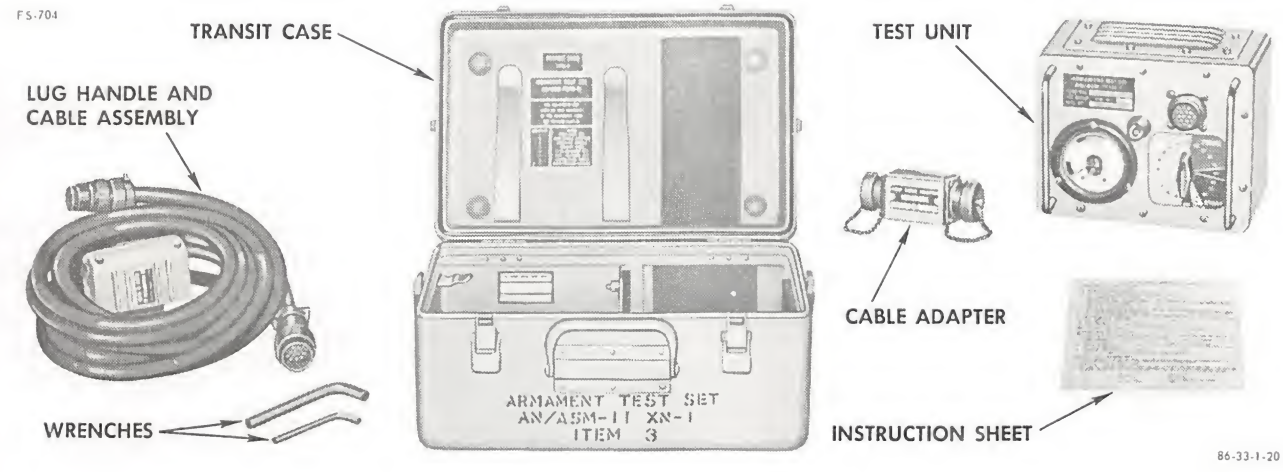

Figure 2-6. AN/ASM-11 Missile Launcher Test Set

2-21. TEST SET, MISSILE LAUNCHER, AN/ASM-11.

2-22. The AN/ASM-11 missile launcher test set is designed to check the aircraft AIM-9B missile launching circuitry. The test set provides visual indications of electrical power applications during functional checkout of the aircraft launcher missile firing and jettison circuitry. The test set consists of a test unit, a tester lug, and attaching cables and connectors. (See figure 2-6.) The test unit contains a go no-go indicator meter, a test function selector switch, a power indicator light, and related wiring and components. The indicator meter, which is essentially a voltmeter, indicates electrical voltages by means of a pointer which moves to different colored bands on the face of the meter. The three different colored bands on the face of the meter are black, yellow, and red. The black band indicates zero voltage, the yellow band indicates standby voltage and circuit continuity, and the red band indicates firing voltages. The test function selector switch arranges the circuitry inside of the test unit to monitor different functions of the aircraft and launcher circuitry. Selector switch positions are color-coded to match the colored bands on the face of the meter. Whenever the selector switch is positioned in a specific colored area, the meter pointer indication should correspond. Indications outside of the proper colored area are no-go readings which require rejection of the launcher and/or aircraft until the malfunction is repaired. The power indicator light, on the face of the test

unit, provides a visual indication of when power is available to the test unit. The tester lug, designed to be installed below the launcher detent latch, provides for all electrical connections between test unit, launcher-rail firing contacts, and launcher umbilical connector. Electrical cables and connectors are supplied to provide for connection of the test unit and tester lug to aircraft and launcher circuitry. A watertight, shockproof, transit case is provided for carrying and storing the AN/ASM-11 test set. Hex wrenches, for actuating launcher detent latches, are included with the case. An instruction sheet, providing operating instructions, is attached to the lid.

SECTION III

MUNITION DESCRIPTION

3-1. GENERAL.

3-2. This section contains general and specific descriptive information for the conventional munitions that can be carried and released from F-86 aircraft. Physical characteristics such as weight, length, and height or diameter are provided for each munition. Conventional bomb fuzing information is also included.

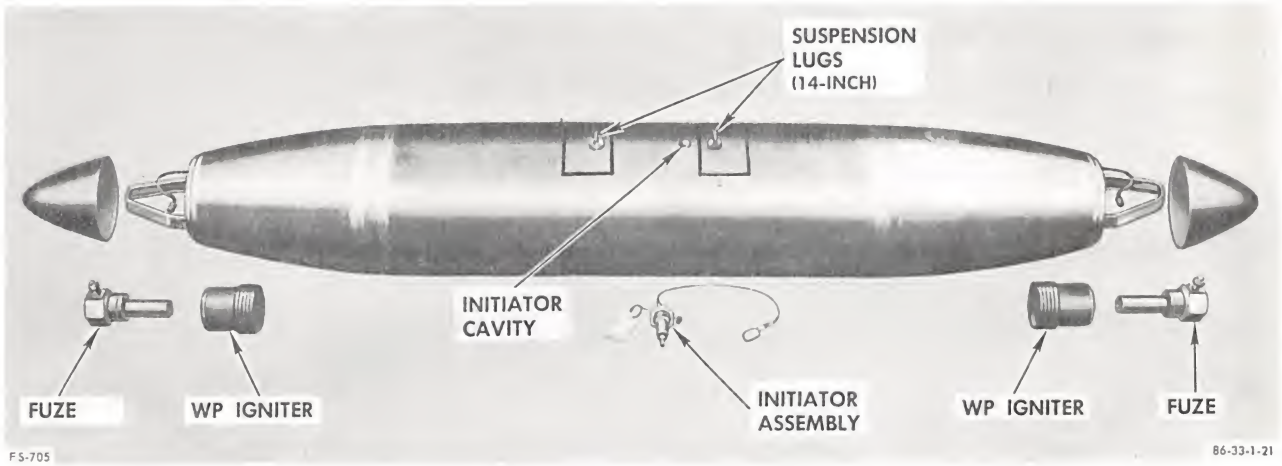

Figure 3-1. BLU-1/B, BLU-1B/B, and BLU-27/B Fire Bomb (Typical)

3-3. BOMB, FIRE, 750-POUND, BLU-1/B, BLU-1B/B, and BLU-27/B.

3-4. The BLU-1/B fire bomb is an incendiary air munition designed for external carriage on the aircraft. The bomb has a cylindrical body with a tapered nose and tail. (See figure 3-1.) The basic structural material is aluminum with steel suspension lugs inserted in the top of the bomb. A reinforced area below each suspension lug provides for forced ejection from aircraft pylons having forced ejection capabilities. An initiator cavity is between the suspension lugs on top of the bomb. An igniter cavity is at each end bulkhead of the bomb. Electrical cables, internally installed in the bomb, provide for electrical connection of the initiator and the igniter fuzes. The bomb is fitted with removable nose and tail end caps which provide covers for the fuze-igniter assemblies. The BLU-1B/B fire bomb is externally identical to the BLU-1/B, except that the BLU-1B/B has an initiator adapter nut over the initiator well and has higher suspension lugs. The BLU-27/B fire bomb is a welded, one-piece version of the BLU-1B/B and is externally identical, except that the BLU-27/B has no clamp bar on the center section of the bomb.

3-5. PHYSICAL CHARACTERISTICS.

3-6. Weight:

a. Weight of bomb empty: 82.25 pounds.

b. Weight of bomb filled (100 gallons incendiary (filler): 697.0 pounds.

3-7. Dimensions:

a. Length of complete round: 129.9 inches.

b. Diameter of bomb body: 18.5 inches.

3-8. Components of a complete round:

a. Body, bomb, BLU-1/B, BLU-1B/B, or BLU-27/B.

b. Filler, incendiary, 100 gallons.

c. Igniters, white phosphorus (WP), AN-M23A1, two each.

d. Fuze, FMU-7/B, two each, or FMU-7A/B, two each.

e. Assembly, initiator.

f. Assembly, cable.

g. Cap, bomb end, two each.

3-9. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

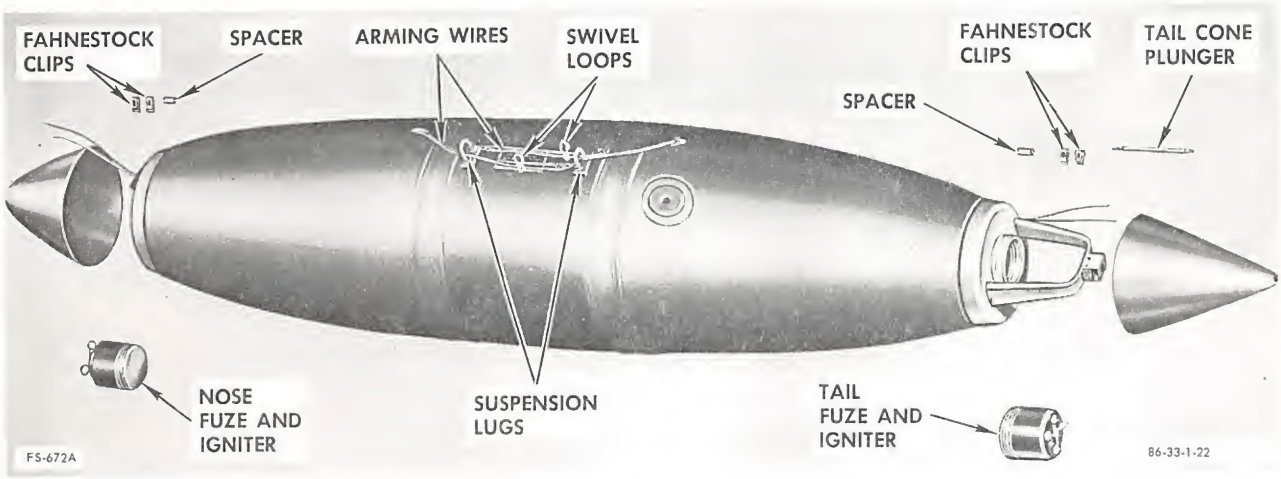

Figure 3-2. M116A2 Fire Bomb and Components

3-10. BOMB, FIRE, 750-POUND, M116A2.

3-11. The M116A2 fire bomb is an incendiary air munition designed for external carriage on the aircraft. The bomb has a cylindrical body with a tapered nose and tail. (See figure 3-2.) The basic structural material is aluminum with steel suspension lugs bolted to the top of the bomb. A reinforced area below each suspension lug provides for forced ejection from the aircraft pylons having forced ejection capabilities. An arming wire guide tube is installed in each end of the bomb, so that arming wires may be internally installed in the bomb. The bomb is fitted with a removable nose cap and tail cone. An igniter cavity, beneath the nose cap and tail cone, is provided in each end of the bomb. An M23 or an AN-M23A1 igniter may be used with the bomb; however, because of a difference between the diameter of the fuze wells of the igniters, an M23 igniter is compatible only with an M173 bomb fuze, while an AN-M23A1 igniter is compatible only with an AN-M173A1 bomb fuze. A nose cap guide, mounted on the forward bulkhead of the bomb, provides for attachment of the nose cap to the bomb. A tail cone plunger, fitted to a bracket on the rear bulkhead of the bomb, provides for attachment of the tail cone to the bomb. The arming wires are the means of attaching the nose cap guide and tail cone plunger to the bomb.

3-12. PHYSICAL CHARACTERISTICS.

3-13. Weight:

a. Weight of bomb empty: 72.0 pounds.

b. Weight of bomb filled (100 gallons incendiary filler): 685.0 pounds.

3-14. Dimensions:

a. Length of complete round: 137. 0 inches.

b. Diameter of bomb body: 18. 6 inches.

3-15. Components of a complete round:

a. Body, bomb, M116A2.

b. Filler, incendiary, 100 gallons.

c. Igniter, white phosphorus (WP), M23 or AN-M23A1, two each.

d. Fuze, M173 or AN-173A1, one each; bulk, one each.

e. Assembly, arming wire, M17, one each; bulk, one each.

f. Spacer, aluminum, two each.

g. Cap, nose.

h. Cone, tail.

3-16. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

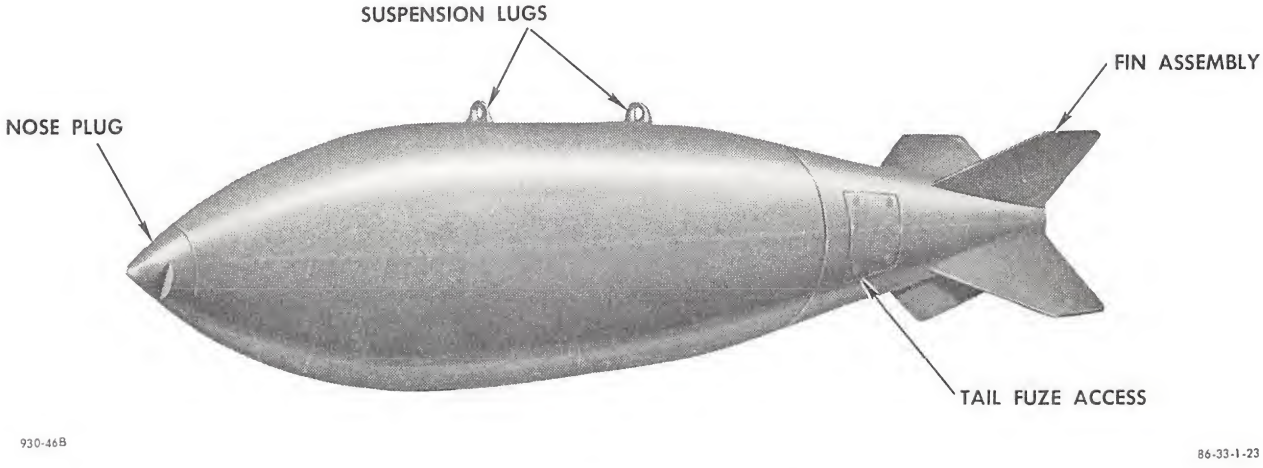

Figure 3-3. MC-1 Gas, GB, Bomb

3-17. BOMB, GAS, GB, 750-POUND, MC-1.

3-18. The MC-1 bomb is a nonpersistent gas bomb designed by conversion and modification of the M117 general-purpose 750-pound bomb. The bomb has a cylindrical metal body with an ogival nose and a tapered aft section to which a conical fin assembly is attached. (See figure 3-3.) The basic structural material of the bomb is steel. Provisions for either single- or double-lug suspension are provided on the top of the bomb. The double-lug suspension provisions are spaced to be compatible with the 14-inch bomb racks. The bomb is adapted for use with pylons having forced ejection systems. The bomb is designed for use with both a nose fuze and a tail fuze. The M131 conical fin assembly, installed on the bomb, increases the aerodynamic performance of the bomb during flight and permits greater accuracy in bombing operations. Antirotational devices are installed on the bomb to prevent the inadvertent rotation of the fin assembly during flight. This fin assembly consists of an elongated fin cone and four identical streamlined blades assembled perpendicularly to the cone. The fin cone contains four access holes. Two access holes, of a modified oval shape approximately 6. 5 inches long, provide for installation of the bomb tail fuze and

attachment of an M44 drive assembly when an M905 bomb tail fuze is utilized. Two smaller holes provide for the attachment of an arming head assembly when an M190 bomb tail fuze is utilized. A closing cover is provided for each access hole. An additional cover with a cutout is supplied to replace the solid cover when a tail fuze requiring the M44 drive assembly is utilized.

3-19. PHYSICAL CHARACTERISTICS.

3-20. Weight:

a. Weight of bomb (assembled with fin assembly M131): approximately 725 pounds.

3-21. Dimensions:

a. Length of assembled bomb: approximately 90 inches.

b. Diameter of bomb body: 16 inches.

3-22. Components of a complete round:

a. Bomb, MC-1.

b. Fuze, nose, M163 (set instantaneously only) or M904 series.

c. Fuze, tail, M190 or M905.

d. Primer-detonator, M14 (nondelay only) or delay element M9 (T2) (instantaneous)

e. Burster charge, M32.

f. Adapter booster, nose, M126 (T45 series).

g. Adapter booster, tail, T46E4.

h. Assembly, fin, M131.

i. Wire, arming.

3-23. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

3-24. FUZING OPTIONS.

3-25. Table 3-I contains the authorized fuze combinations currently available for the MC-1 gas bomb. Only those combinations of fuzes and components shown in this table are used for the bomb. Table 3-II contains information concerning the characteristics of the fuzes that are compatible with the bomb.

NOSE FUZES*			TAIL FUZES*				
MODEL	DELAY ELEMENT	ADAPTER BOOSTER	MODEL	DELAY ELEMENT	DRIVE ASSEMBLY	FLEXIBLE SHAFT	ADAPTER BOOSTER
M163	Integral	T45( )	M190	M14	Integral	Integral	T46E3 or T46E4
M904 series	M9 (T2)	T45( )	M905	M9 (T2)	M44 (T25)	M40 (T40)	T46E3 or T46E4
*Any nose fuze (with components) listed may be used with any tail fuze (with components) listed; however, the M163 and M190 fuzes, or the M904 and M905 fuzes, should be used together for maximum efficiency.							

Table 3-I. Fuze Combinations for MC-1 Gas Bomb

MODEL	ACTION	FUNCTIONING DELAY	FUZE ARMING COMPONENTS	ARMING DELAY	NOTE
NOSE FUZES					
M163	Impact	Instantaneous	Vane, M3 (Refer to note 1.)	692 revolutions	1. The M3 vane is slow-arming and is used for routine bombing missions.
M904E1	Impact	Instantaneous (Refer to note 1.)	Vane	4-second, 6-second, 8-second, 12-second, 16-second, or 20-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.
M904E2	Impact	Instantaneous (Refer to note 1.)	Vane	2-second, 4-second, 6-second, 8-second, 10-second, 12-second, 14-second, 16-second, or 18-second, selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.
TAIL FUZES					
M190	Impact	Nondelay (Refer to note 1.)	Anemometer	657 revolutions (Requires long air travel to arm. Amount of air travel depends on size of bomb and speed of aircraft at time of release.)	1. Issued without primer-detonator. Primer-detonator M14 of delay times indicated is issued separately and assembled in the field.
M905	Impact	Instantaneous (Refer to note 1.)	Drive assembly (Refer to note 2.)	4-second, 6-second, 8-second, 12-second, 16-second or 20-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field. 2. M44 (T25) drive assembly and components are issued separately and assembled when bomb is fuzed.

Table 3-II. MC-1 Bomb Fuze and Component Data

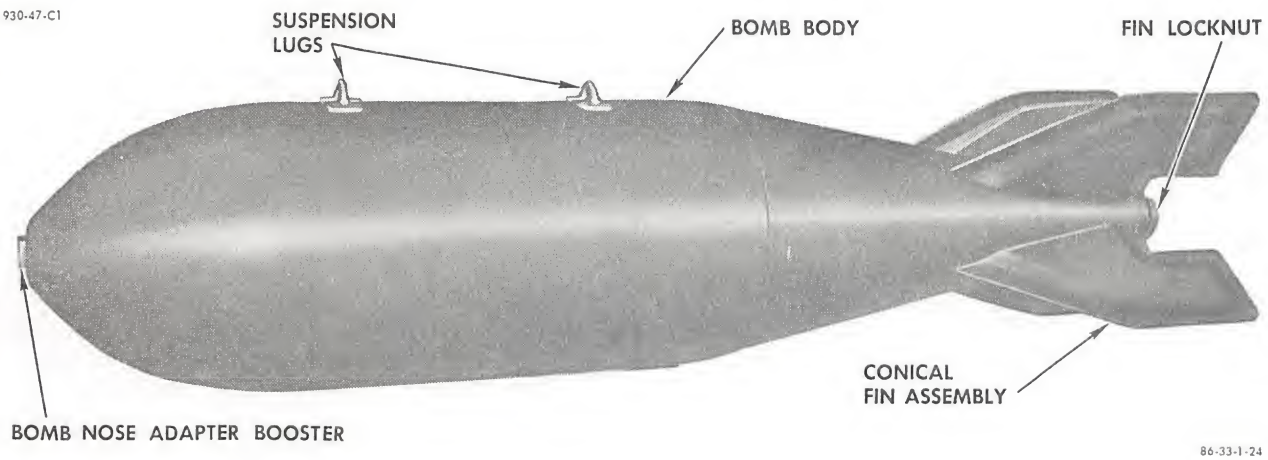

Figure 3-4. AN-M64A1/AN-M65A1 General-Purpose Bomb

3-26. BOMB, GENERAL-PURPOSE, 500/1,000-POUND, AN-M64A1/AN-M65A1.

3-27. The AN-M64A1 and AN-M65A1 general-purpose bombs are similar in design, operation, and application. The major differences are the weight and dimensions of each bomb.

3-28. The AN-M64A1/AN-M65A1 bomb is a general-purpose bomb normally used for demolition operations. The bomb has a cylindrical metal body with an ogival nose and a tapered aft section. (See figure 3-4.) The bomb is fitted with a conical fin assembly when the bomb is used with high-performance aircraft. The fin assembly increases the aerodynamic performance of the bomb and permits greater accuracy in bombing operations. Antirotational devices are installed on the bomb to prevent the inadvertent rotation of the fin assembly during flight. The general-purpose bomb is provided with both single and double suspension lugs that are welded to the bomb case. The double suspension lugs are spaced to be compatible with the 14-inch bomb racks. The bomb may be filled with one of several different types of explosives. A fundamental characteristic of the explosive charge in the bomb is its relative insensitivity to ordinary shock and heat incident to loading, transporting, handling, and storing. A general-purpose bomb is adapted for use with pylons having forced ejection systems. The bomb is designed for use with both a nose and a tail fuze.

3-29. PHYSICAL CHARACTERISTICS.

3-30. Weight:

a. Weight of AN-M64A1 bomb (assembled with fin assembly M128): 566.8 to 585.8 pounds.

b. Weight of AN-M65A1 bomb (assembled with fin assembly M129): approximately 1,165.0 pounds.

3-31. Dimensions:

a. Length of assembled AN-M64A1 bomb: 72.1 inches.

Length of assembled AN-M65A1 bomb: 91.1 inches.

b. Diameter of AN-M64A1 bomb body: 14.18 inches.

Diameter of AN-M65A1 bomb body: 18.8 inches.

3-32. Components of a complete round:

a. Body, bomb (as required).

b. Fuze, nose (as required).

c. Fuze, tail (as required).

d. Primer-detonator, tail fuze (as required).

e. Assembly, arming wire, two each (as required).

f. Assembly, fin (as required).

3-33. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

3-34. FUZING OPTIONS.

3-35. Table 3-III contains the authorized fuze combinations currently available for the AN-M64A1 and AN-M65A1 general-purpose bombs. Only those combinations of fuzes and components shown in this table are used for the bomb. Table 3-IV contains information concerning the characteristics of the fuzes that are compatible with the bomb.

NOSE FUZES		TAIL FUZES			
MODEL	DELAY ELEMENT	MODEL	DELAY ELEMENT	ADAPTER BOOSTER	OTHER COMPONENTS
M163 (using M3 arming vane)	Integral	M175*	M14	M102, M102A1, M115, or M115A1	M128 conical fin assembly*
M904 series	M9 (T2)	M176†	M14	M102, M102A1, M115, or M115A1	M129 conical fin assembly†
M188/M914 VT	(The use of an M1A1 arming delay is required.)				
*Used with AN-M64A1 general-purpose bomb †Used with AN-M65A1 general-purpose bomb					

Table 3-III. Fuze Combinations for AN-M64A1 and AN-M65A1 General-Purpose Bomb

MODEL	ACTION	FUNCTIONING DELAY	FUZE ARMING COMPONENTS	ARMING DELAY	NOTE
NOSE FUZES					
M163	Impact	0.1-second or instantaneous	Vane, M1 or M3 (Refer to note 1.)	409 revolutions or 692 revolutions	1. The M1 arming vane is fast-arming. The M3 arming vane is slow-arming and is used for routine bombing missions.
M904E1	Impact	Instantaneous 0.01-second 0.025-second 0.05-second 0.10-second 0.25-second (Refer to note 1.)	Vane (attached)	4-second, 6-second, 8-second, 12-second, 16-second or 20-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.

Table 3-IV. AN-M64A1 and AN-M65A1 Bomb Fuze and Component Data

MODEL	ACTION	FUNCTIONING DELAY	FUZE ARMING COMPONENTS	ARMING DELAY	NOTE
			NOSE FUZES		
M904E2	Impact	Instantaneous 0.01-second 0.025-second 0.05-second 0.10-second 0.25-second (Refer to note 1.)	Vane (attached)	2-second, 4-second, 6-second, 8-second, 10-second, 12-second, 14-second, 16-second, or 18-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.
M188/ M914	VT	(Refer to note 1.)	Vane (attached)		1. The use of an M1A1 arming delay is required.
			TAIL FUZES		
M175	Impact	Nondelay 0.01-second 0.025-second 0.10-second 0.25-second	Vane, M4 or M5 (Refer to note 1.)	150 to 170 revolutions	1. The M4 arming vane is fast arming. The M5 vane is slow arming and is used for routine bombing missions.
M176	Impact	Nondelay 0.01-second 0.025-second 0.10-second 0.25-second	Vane, M5 (Refer to note 1.)	150 to 170 revolutions	

Table 3-IV. AN-M64A1 and AN-M65A1 Bomb Fuze and Component Data (Continued)

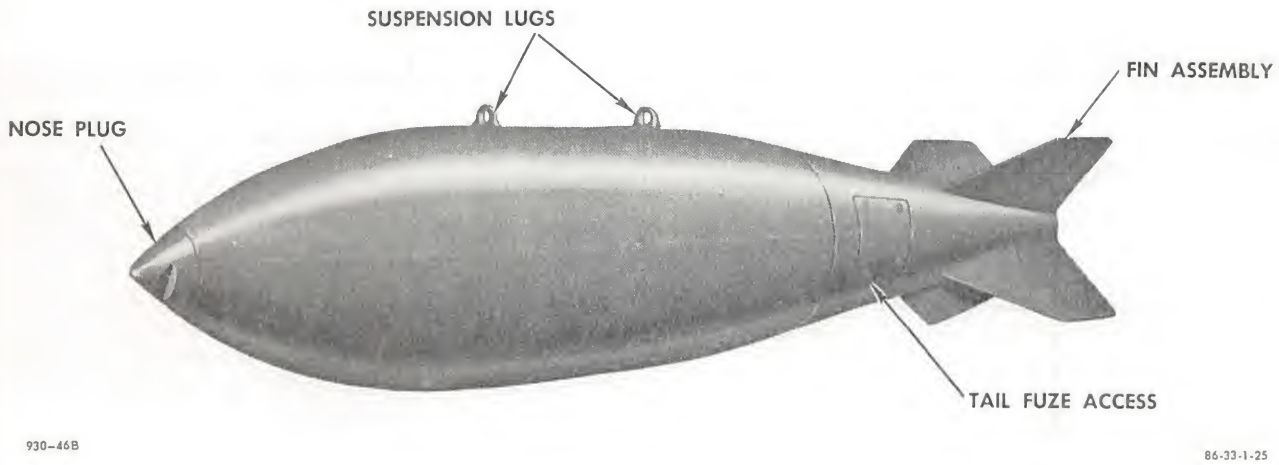

Figure 3-5. M117 General-Purpose Bomb

3-36. BOMB, GENERAL-PURPOSE, 750-POUND, M117.

3-37. The M117 bomb is a general-purpose bomb normally used for demolition operations. The bomb has a cylindrical metal body with an ogival nose and a tapered aft section to which a conical fin assembly is attached. (See figure 3-5.) The basic structural material of the bomb is steel. Provisions for either

single- or double-lug suspension are provided on the top of the bomb. The double suspension lug provisions are spaced to be compatible with the 14-inch bomb racks. The bomb may be filled with one of several different types of explosives. A fundamental characteristic of the explosive charge in the bomb is its relative insensitivity to ordinary shock and heat incident to loading, transporting, handling, and storing. A general-purpose bomb is adapted for use with pylons having forced ejection systems. The M131 conical fin assembly, installed on the bomb, increases the aerodynamic performance of the bomb during flight and permits greater accuracy in bombing operations. Antirotational devices are installed on the bomb to prevent the inadvertent rotation of the fin assembly during flight. The fin assembly consists of an elongated fin cone and four identical streamlined blades assembled perpendicularly to the cone. The fin cone contains four access holes. Two access holes, of a modified oval shape approximately 6.5 inches long, provide for installation of the bomb tail fuze and attachment of an M44 drive assembly when an M905/M906 bomb tail fuze is utilized. Two smaller holes provide for the attachment of an arming head assembly when an M190 bomb tail fuze is utilized. A closing cover is provided for each access hole. An additional cover with a cutout is supplied to replace the solid cover when a tail fuze requiring the M44 drive assembly is utilized.

3-38. PHYSICAL CHARACTERISTICS.

3-39. Weight:

a. Weight of bomb (assembled with fin assembly M131): 823.0 pounds.

3-40. Dimensions:

a. Length of assembled bomb: 90.0 inches.

b. Diameter of bomb body: 16.0 inches.

3-41. Components of a complete round:

a. Bomb, M117.

b. Fuze, tail (as required).

c. Fuze, nose (as required).

d. Primer-detonator (as required).

e. Assembly, arming wire, M52 (T10), two each.

f. Assembly, fin, M131 (T152E2).

g. Adapter booster, nose, M126 (T45E1).

h. Adapter booster, tail T46E4.

i. Wire, arming.

3-42. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

3-43. FUZING OPTIONS.

3-44. Table 3-V contains the authorized fuze combinations currently available for the M117 general-purpose bomb. Only those combinations of fuzes and components as shown in this table are used for the bomb. Table 3-VI contains information concerning the characteristics of the fuzes that are compatible with the bomb.

NOSE FUZES			TAIL FUZES				
MODEL	DELAY ELEMENT	ADAPTER BOOSTER	MODEL	DELAY ELEMENT	DRIVE ASSEMBLY	FLEXIBLE SHAFT	ADAPTER BOOSTER
M163	Integral	T45E1	M190	M14	Integral	Integral	T46E3 or T46E4
M904 series	M9 (T2)	T45E1	M905 (T771E4)	M9 (T2)	M44 (T25)	M40 (T40)	T46E3 or T46E4
			M906	T5 or T6	M44 (T25)	M40 (T40)	T46E3 or T46E4
M188/ M914	Integral and external M1A1 arming delay required.						

- Any nose fuze (with components) listed may be used with any tail fuze (with components) listed; however, the M163 and M190 fuzes or the M904 and M905 or M906 fuzes should be used together for maximum efficiency.
- For skip bombing, use standard conical nose plug and M906 tail fuze only.

Table 3-V. Fuze Combinations for M117 General-Purpose Bomb

MODEL	ACTION	FUNCTIONING DELAY	FUZE ARMING COMPONENTS	ARMING DELAY	NOTE
NOSE FUZES					
M163	Impact	0.1-second or instantaneous	Vane, M1 or M3 (Refer to note 1.)	409 revolutions or 692 revolutions	1. The M1 arming vane is fast arming. The M3 arming vane is slow arming and is used for routine bombing missions.
M904E1	Impact	Instantaneous 0.01-second 0.025-second 0.05-second 0.10-second 0.25-second (Refer to note 1.)	Vane (attached)	4-second, 6-second, 8-second, 12-second, 16-second, or 20-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.
M904E2	Impact	Instantaneous 0.01-second 0.025-second 0.05-second 0.10-second 0.25-second (Refer to note 1.)	Vane (attached)	2-second, 4-second, 6-second, 8-second, 10-second, 12-second, 14-second, 16-second, or 18-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field.
M188/ M914	VT	(Refer to note 1.)	Vane (attached)		1. The use of an M1A1 arming delay is required.

Table 3-VI. M117 Bomb Fuze and Component Data

MODEL	ACTION	FUNCTIONING DELAY	FUZE ARMING COMPONENTS	ARMING DELAY	NOTE
TAIL FUZES					
M190	Impact	Instantaneous 0.01-second 0.025-second 0.1-second 0.24-second (Refer to note 1.)	Anemometer	657 revolutions (Requires long air travel to arm. Amount of air travel depends on size of bomb and speed of aircraft at time of release.)	1. Issued without primer-detonator. Primer-detonator M14 of delay times indicated is issued separately and assembled in the field.
M905	Impact	Instantaneous 0.01-second 0.025-second 0.05-second 0.10-second 0.25-second (Refer to note 1.)	Drive assembly and flexible shaft (Refer to note 2.)	4-second, 6-second, 8-second, 12-second, 16-second, or 20-second selectable arming	1. Issued without delay element. M9 delay element of delay times indicated is issued separately and assembled in the field. 2. M44 (T25) drive assembly and components are issued separately and assembled when bomb is fuzed.
M906 tail fuze	Impact	12.5(±1.5) seconds (T6). (Refer to note 1.)	Drive assembly and flexible shaft (Refer to note 2.)	No selectable arming	1. Issued without delay element. Delay elements of delay times indicated are issued separately and assembled in the field. 2. M44 (T25) drive assembly and components are issued separately and assembled when bomb is fuzed.

Table 3-VI. M117 Fuze and Component Data (Continued)

Figure 3-6. M129E1 Leaflet Bomb

3-45. BOMB, LEAFLET, M129E1

3-46. The M132E1 bomb is a leaflet bomb designed to deliver and distribute letters, posters, and other leaflet-type materials. The bomb has a cylindrical body with an ogival nose and a tapered aft section similar to the 750-pound general-purpose bomb. (See figure 3-6.) The bomb is fitted with a conical fin assembly which increases the aerodynamic performance of the bomb and permits greater accuracy in delivery operations. The basic structural material of the bomb is fiber glass with steel suspension lugs inserted in the top of the bomb. A steel reinforcing plate below the suspension lugs provides for forced ejection from aircraft pylons. Provisions for either single- or double-lug suspension are provided on the top of the bomb. The double suspension lugs are spaced to be compatible with the 14-inch bomb racks. The cylindrical portion of the bomb separates to permit insertion of the leaflets. The M148 tail fin assembly consists of four fiber glass sections glued and riveted together to form a cone approximately 20 inches long. Four fin blades approximately 23 inches long are attached to the cone. The bomb is designed for use with a nose fuze only.

3-47. PHYSICAL CHARACTERISTICS.

3-48. Weight:

a. Weight of bomb empty: 92.0 pounds.

b. Weight of assembled bomb: depends upon weight leaflet paper used.

3-49. Dimensions:

a. Length of complete round: 90.02 inches.

b. Diameter of bomb body: 16.0 inches.

3-50. Components of a complete round:

a. Bomb, leaflet, M129E1.

b. Leaflets.

c. Fuze, AN-M147A1.

d. Cord (Primacord), detonating, 50-grain, type 4 Pliofilm-wrapped, 14.5 feet long.

e. Assembly, fin, M148.

f. Assembly, adapter booster, nose, T-59.

g. Wire, arming.

3-51. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

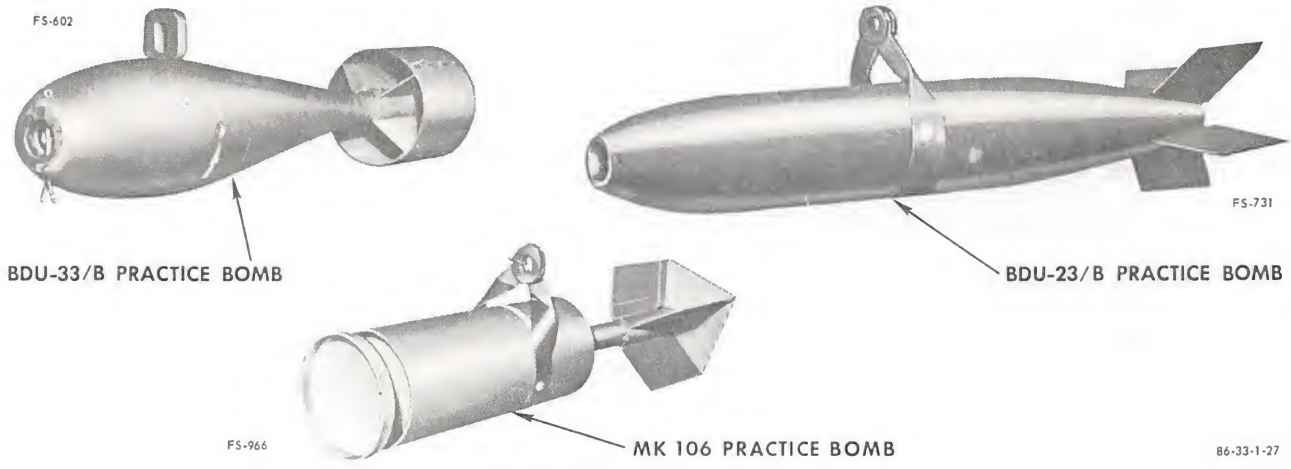

Figure 3-7. BDU-23/B, BDU-33/B, and MK 106 Practice Bombs

3-52. BOMB, PRACTICE, 25-POUND, BDU-23/B, BDU-33/B, and 5-POUND, MK 106

3-53. The practice bombs are identical in operation and capabilities. Only the external appearance and physical characteristics of the bombs are different. The BDU-23/B bomb has an elongated body and a fin assembly which is composed of four individual fin blades. (See figure 3-7.) A metal band around the body of the bomb provides for a single suspension lug to be attached. The BDU-33/B practice bomb has a teardrop body and a fin assembly which is composed of four shrouded fin blades and a center tube. (See figure 3-7.) A conical section covers the center tube and is attached to the body section. A single suspension lug is threaded into the bomb body and cemented in place. The MK 106 has a cylindrical body, a blunt nose, and a box-type fin assembly. (See figure 3-7.) A metal band around the body provides for a single suspension lug to be attached.

3-54. Each bomb contains a signal (spotting charge) and firing pin assembly. The firing pin assembly detonates the signal upon impact. The signal produces a smoke cloud to provide a visual indication of point of impact.

3-55. PHYSICAL CHARACTERISTICS.

3-56. Weight:

a. Weight of assembled BDU-23/B bomb with signal and firing pin: 25.38 pounds.

Weight of assembled BDU-33/B with signal and firing pin: 23.7 pounds.

Weight of assembled MK 106 with signal and firing pin: 4.56 pounds.

b. Weight of MK4, Mod 3 signal: 0.16 pound.

3-57. Dimensions:

a. Length of assembled BDU-23/B bomb: 19.44 inches.

Length of assembled BDU-33/B bomb: 22.5 inches.

Length of assembled MK 106 bomb: 18.75 inches.

b. Diameter of BDU-23/B bomb body: 4.75 inches.

Diameter of BDU-33/B bomb body: approximately 4 inches.

Diameter of MK 106 bomb body: approximately 3.9 inches.

3-58. Components of a complete round:

a. Bomb, BDU-23/B, BDU-33/B, or MK 106.

b. Pin, cotter.

c. Pin, firing, MK1, Mod 0.

d. Signal, practice bomb, MK4, Mod 3.

3-59. Suspension requirements:

a. Bomb container, practice, AF/B37K-1.

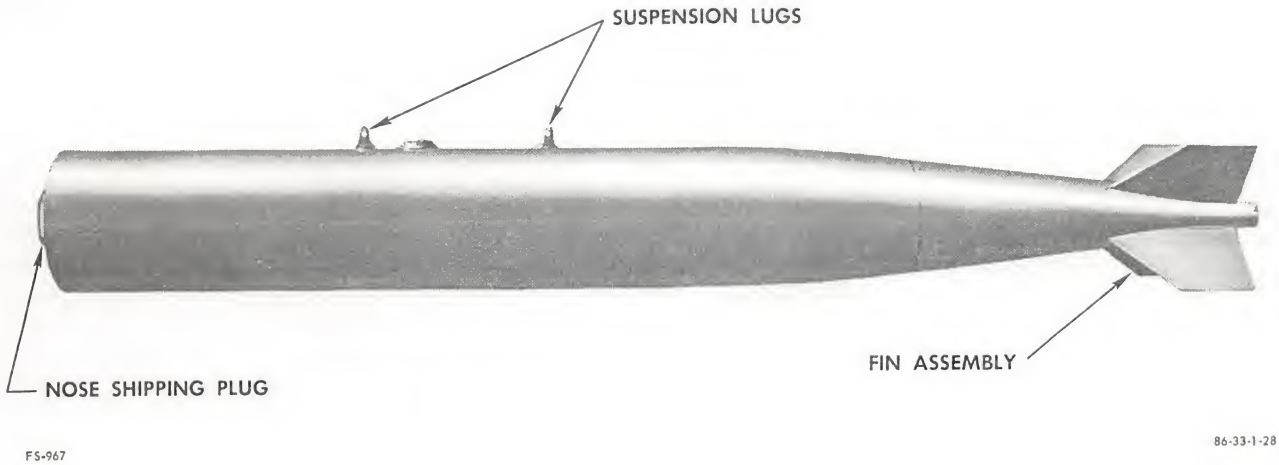

Figure 3-8. MLU-10/B Land Mine

3-60. MINE, LAND, 750-POUND, MLU-10/B.

3-61. The MLU-10/B is an aerial-dropped, high-explosive mine. The mine is bluff-shaped, antiricochet design using a low-drag fin. (See figure 3-8.) A conical fin assembly is installed on the aft end of the mine and held in place by six setscrews. The fin assembly may be attached at various positions in order to clear obstructions that may be encountered when loading the mine on the aircraft. Double suspension lugs are installed on the top of the mine. The lugs are spaced to be compatible with the 14-inch bomb racks. The mine is adapted for use with pylons having forced ejection systems. Fuzing of the mine is provided by an electric nose fuze only. The fuze consists of a target-detecting device (TDD), a battery assembly, and a booster. A safety indicator on the target-detecting device provides a visual indication of a safe and unarmed assembled fuze.

3-62. PHYSICAL CHARACTERISTICS.

3-63. Weight:

a. Weight of mine unlaoded: approximately 450 pounds.

b. Weight of mine loaded: approximately 700 pounds.

3-64. Dimensions:

a. Length of complete round (including fuze and fin assembly): 96 inches.

b. Diameter of mine body: 10.75 inches.

3-65. Components of a complete round.

a. Case, mine (loaded), MLU-10/B.

b. Fuze, nose, FMU-8/B.

c. Booster, explosive.

d. Device, arming.

e. Assembly, power supply.

f. Assembly, bomb fin, Mark 82.

3-66. Suspension requirements:

a. Rack, bomb, 14-inch spacing double-lug with arming solenoids.

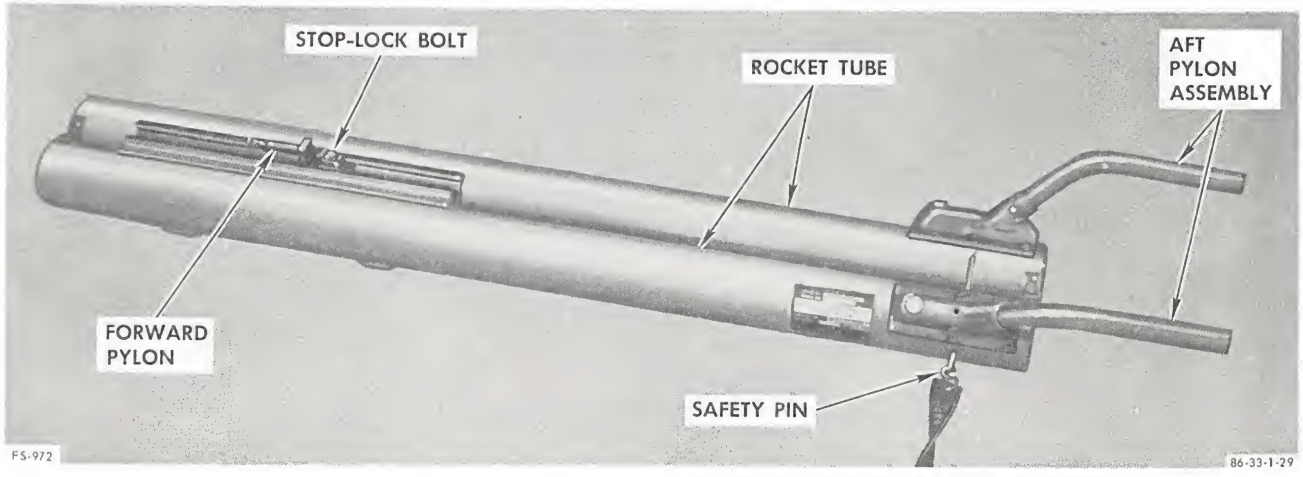

Figure 3-9. MA-2A Rocket Launcher

3-67. LAUNCHER, ROCKET, MA-2A.

3-68. The MA-2A rocket launcher is an externally carried store, capable of launching two 2.75-inch folding-fin aircraft rockets (FFAR). (See figure 3-9.) The MA-2A launcher is an improved version of the MA-2 launcher, but the external appearance and operation of the launchers remain the same. The launcher consists of two launcher tube assemblies, one forward and two aft pylon mounting assemblies, and electrical circuit wiring. The launcher tubes are fabricated of aluminum alloy and are joined together at each end by spacer brackets and bolts. Detent devices within the tubes restrain the rockets against normal flight loads. These devices also complete the rocket firing electrical circuit. Each launcher tube is provided with a safety pin which, when installed, interrupts the rocket-firing circuitry. Each aft pylon mounting assembly contains an insulated, internal, spring-loaded contact and a single-wire circuit for transmission of electrical current from the aircraft circuitry to each rocket-firing contact within the launcher tube.

3-69. PHYSICAL CHARACTERISTICS.

3-70. Weight:

a. Weight of launcher unloaded: approximately 10 pounds.

Weight of launcher loaded: approximately 47 pounds.

3-71. Dimensions:

a. Length of launcher: approximately 47 inches.

b. Width of launcher: approximately 6.5 inches.

c. Height of launcher: approximately 7 inches.

3-72. Suspension requirements.

a. Mounts, rocket launcher.

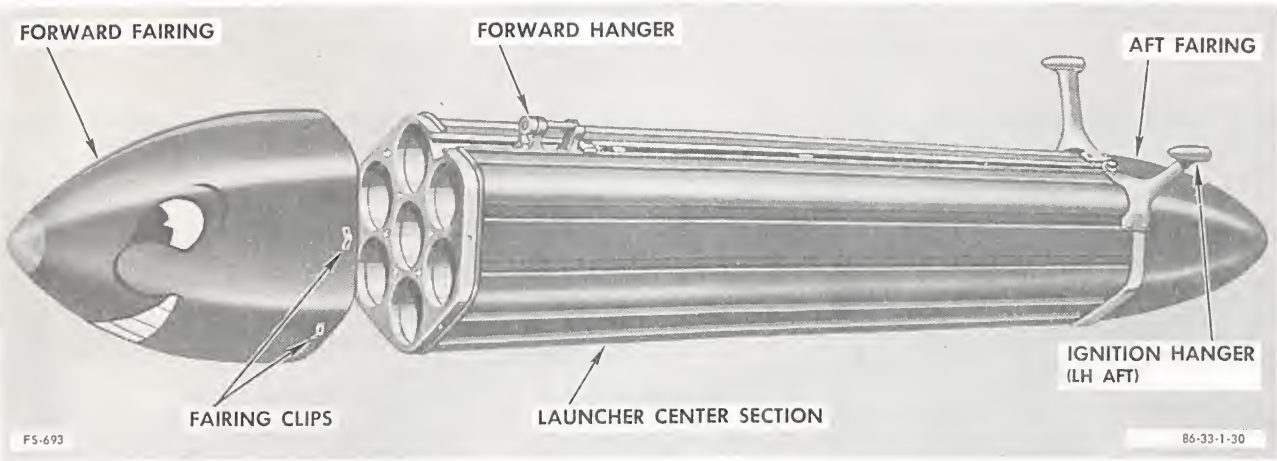

Figure 3-10. MA-3 Rocket Launcher

3-73. LAUNCHER, ROCKET, MA-3.

3-74. The MA-3 rocket launcher is an expendable externally carried store, capable of launching seven 2.75-inch folding-fin aircraft rockets (FFAR). (See figure 3-10.) The launcher consists of three major components; a center section, and a forward and a rear frangible fairing. The center section is constructed of seven fiberboard tubes which are protected and held together by a strong plastic coating. Metal bulkheads and filler strips strengthen the launcher and provide additional protection. Detent devices within the tubes restrain the rockets against normal flight loads and provide electrical contact to ignite the rockets. Contact fingers on the rear bulkhead provide a ground to complete the rocket-firing circuitry. An extruded aluminum track imbedded in the launcher center section supports the forward hanger in a manner that permits extensive fore-and-aft adjustment to accommodate various mounting provisions. A spring-steel stop lock and bolt secures the hanger at the desired position. The aft hangers serve to stabilize the launcher and to transmit electrical power from the aircraft to the launcher-firing circuitry. The launcher fairings are constructed of treated paper; therefore, they must be handled with care, as they are easily damaged. The fairings are equipped with lugs which engage fasteners on the launcher bulkheads to secure the fairings in position. The fairings are marked FRONT and REAR, and they must be installed in their respective positions.

3-75. PHYSICAL CHARACTERISTICS.

3-76. Weight:

a. Weight of launcher unloaded: 22 pounds.

b. Weight of launcher loaded: 153 pounds.

3-77. Dimensions:

a. Length of launcher (without fairings): 48 inches.

Length of launcher (with fairings): 70.75 inches.

b. Width of launcher: 9.375 inches.

c. Height of launcher: 9.75 inches.

3-78. Suspension requirements:

a. Mounts, rocket launcher.

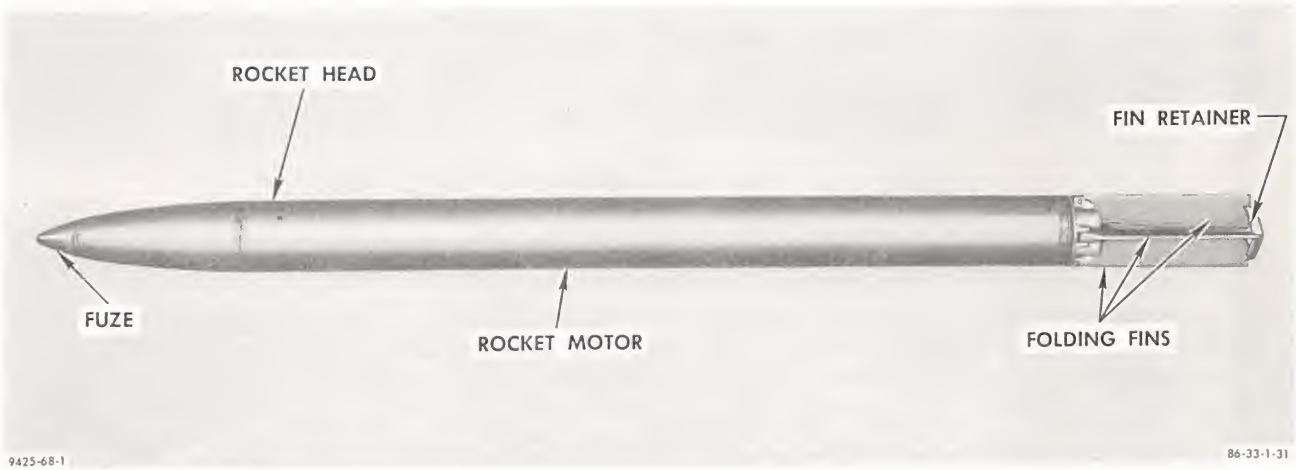

Figure 3-11. 2.75-Inch Folding-Fin Aircraft Rocket (FFAR)

3-79. ROCKET, 2.75-INCH FFAR.

3-80. The 2.75-inch folding-fin aircraft rocket (FFAR) is designed to provide air-to-air armament for interceptor aircraft and air-to-ground armament for tactical aircraft. (See figure 3-11.) The rocket is adapted to use a high-explosive (HE) head, a high-explosive antitank (HEAT) head, a white phosphorous (WP) head, a flechette head, or a plaster-filled (inert) head for practice. The 2.75-inch rocket motor is equipped with stabilizing fins which fold within the diameter of the rocket motor for firing from tubular launchers.

3-81. PHYSICAL CHARACTERISTICS.

3-82. Weight:

a. Weight of assembled 2.75-inch rocket: approximately 18.5 pounds.

3-83. Dimensions:

a. Length of rocket: 48 inches (fins folded).

b. Diameter of rocket body: 2.75 inches.

3-84. Components of a complete round:

a. Rocket, 2.75-inch FFAR.

b. Protector, fin.

3-85. Launcher requirements:

a. Rocket launcher capable of launching 2.75-inch rockets.

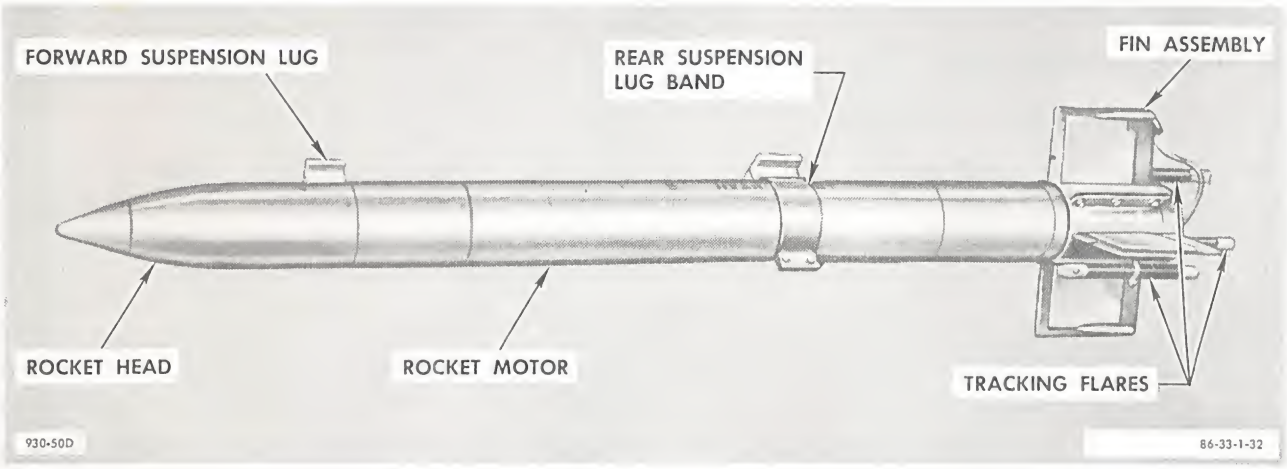

Figure 3-12. TDU-11/B 5-Inch HVAR Target Rocket

3-86. ROCKET, TARGET, 5-INCH HVAR, TDU-11/B.

3-87. The TDU-11/B target rocket is a standard 5-inch high-velocity aircraft rocket (HVAR) that has been modified to be fired from an AIM-9B missile launcher. The rocket is designed to provide a target for AIM-9B missile training. (See figure 3-12.) Basic components of the target rocket are the rocket head, motor assembly, fin assembly, suspension lugs, and igniter wire assembly. The rocket head and motor ends are threaded to provide for assembly. The rocket head consists of a lead-filled, 5-inch, MK6 Mod I head and extension. The 5-inch rocket motor is a seamless steel tube filled with a solid propellant. A fin assembly which consists of a bracket with four stabilizing fins is attached to the aft end of the rocket motor. Two suspension lugs are attached to the rocket motor assembly. The forward lug is attached to the top of the motor with screws, and the rear lug is attached to an adjustable band which is mounted on the motor. Four parasitic tracking flares are attached to the fin assembly. The igniter wire assembly provides for electrical connection of the rocket to the aircraft missile-firing circuitry.

3-88. PHYSICAL CHARACTERISTICS.

3-89. Weight:

a. Weight of assembled rocket: approximately 140 pounds.

3-90. Dimensions:

a. Length of rocket: 78 inches.

b. Diameter of rocket: 5 inches.

3-91. Complete round:

a. Rocket, target, 5-inch HVAR, TDU-11/B

3-92. Components of a complete round:

a. 5-inch HVAR motor.

b. Four tracking flares, W112B or MK 21, Mod 0.

c. Target group, TDU-14/B.

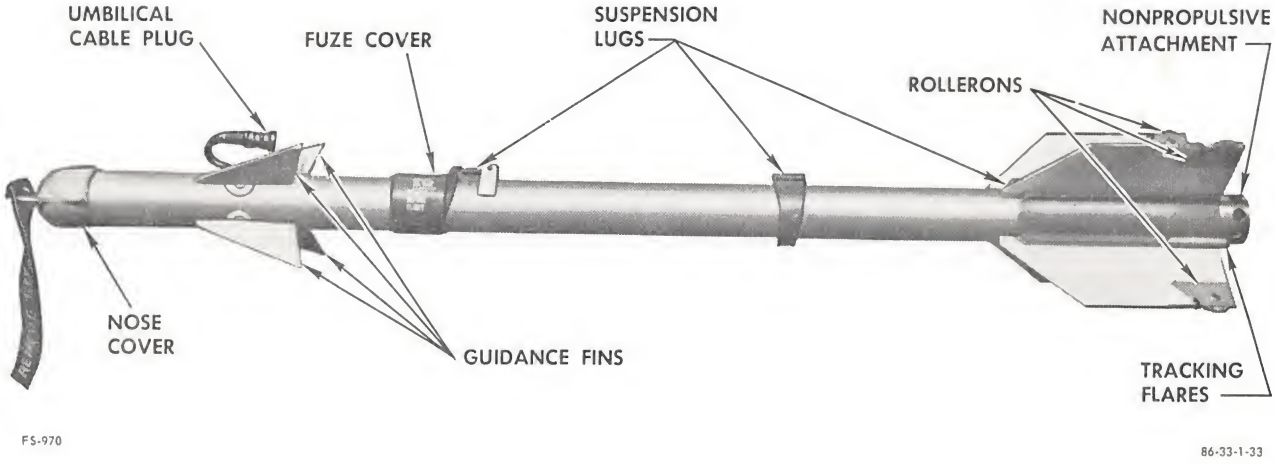

Figure 3-13. AIM-9B Missile

3-93. MISSILE, AIM-9B.

3-94. The AIM-9B guided missile is a supersonic air-to-air homing weapon that uses infrared passive target detection, proportional navigation guidance, and a torque balance control. The missile is designed to be launched from an aircraft externally-mounted, rail-type launcher. Each missile consists of four external sections: the guidance and control section, a warhead, an influence fuze assembly, and a rocket motor section. (See figure 3-13.) All sections have threaded ends to provide for assembly. The guidance and control section contains the missile directional control units, a turbogenerator electrical unit, and four control fins. A contact fuze is mounted into the aft end of this section. The warhead is assembled to the aft end of the guidance and control section. The influence fuze assembly is mounted on the aft end of the warhead. The rocket motor section is mounted on the aft end of the influence fuze assembly. Three suspension lugs which provide for loading the missile on the launcher are attached to the rocket motor. Four stabilizing fins are attached at equal-distance points around the rocket motor. A rolleron device which effectively opposes the roll rate of the missile during flight is mounted on each fin. An umbilical cable and two contacts mounted in the forward suspension lug provide for electrical connection of the missile to the aircraft missile-firing circuitry. The umbilical cable is attached to a connector which shears when the missile is launched.

3-95. PHYSICAL CHARACTERISTICS.

3-96. Weight:

a. Weight of assembled missile: approximately 158 pounds.

3-97. Dimensions:

a. Length of missile: 110 inches.

b. Diameter of missile: 5 inches.

3-98. Components of a complete round:

a. Missile, AIM-9B.

b. Attachment, nonpropulsive.

c. Cover, guidance and control section.

d. Cover, influence fuze assembly.

3-99. CARTRIDGE, .50-CALIBER.

3-100. Two different types of .50-caliber cartridges are available. One type is designated as CARTRIDGE, CAL. .50, BALL (M2 or M33). This cartridge has a solid projectile and is copper-colored. The other is designated CARTRIDGE, CAL. .50 ARMOR-PIERCING-INCENDIARY (API) M8. The point of this cartridge contains an incendiary filler, and the tip is aluminum. Cartridge links are used to assemble the cartridges into belts. Loading crews receive the belted cartridges for loading.

3-101. PHYSICAL CHARACTERISTICS.

3-102. Dimensions:

a. Length of round: 5.45 inches.

b. Diameter of round: 0.5 inch.

3-103. Gun requirement:

a. Gun, .50-caliber, type M-3.

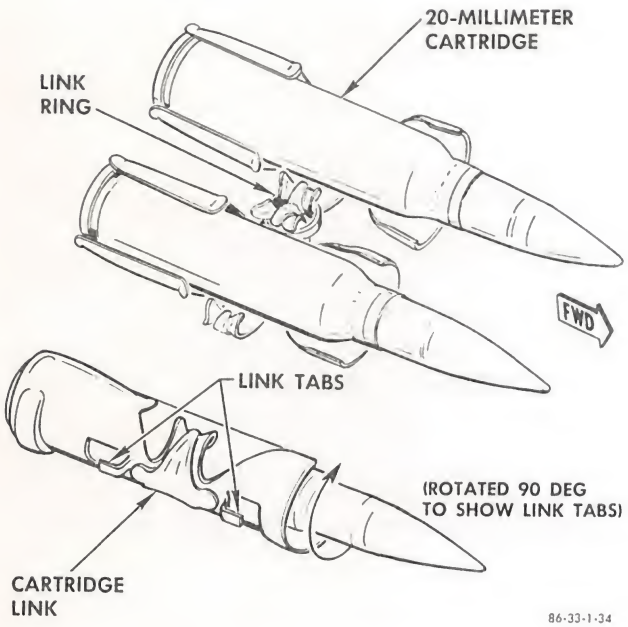

Figure 3-14. 20-Millimeter Cartridge

3-104. CARTRIDGE, 20-MILLIMETER.

3-105. The 20-millimeter cartridges, as furnished to the loading crew, are assembled in cartridge belts. Each 20-millimeter cartridge is inserted in a cartridge link, and link rings are then used to connect the links to form a cartridge belt. (See figure 3-14.) Three different types of 20-millimeter cartridges are available.

1. Cartridge, 20 mm, target practice (TP), M-55. This ammunition is used for target practice to develop shooting accuracy. The projectile is a solid body.

2. Cartridge, 20 mm, high-explosive incendiary (HEI), M56A2. This ammunition is used against aircraft and light-material targets. The projectile body is a steel casing loading with an incendiary composition. An M505 series fuze is attached to the projectile.

3. Cartridge, 20 mm, armor-piercing incendiary (API, M-53. This ammunition is used against armored targets. The projectile is a solid steel body with a nose cavity loaded with an incendiary composition.

3-106. PHYSICAL CHARACTERISTICS.

3-107. Dimensions:

a. Length of round: 6.615 inches.

b. Diameter of round: 20 millimeters (approximately 0.79 inch).

3-108. Gun requirement:

a. Gun, 20-millimeter, type M-39.